

SEQUENCE LISTING

<110> Altmann, Scott W

Wang, Luquan

Graziano, Michael

Murgolo, Nick

Davis, Harry

<120> NPC1L1 (NPC3) AND METHODS OF USE THEREOF

<130> JB01603-K1-US

<140>

<141> 2003-08-22

<150> 60/397,442

<151> 2002-07-19

<150> 10/621,758

<151> 2003-07-17

<160> 50

<170> PatentIn version 3.1

<210> 1

<211> 3996

<212> DNA

<213> Rattus sp.

<220>

<221> CDS

<222> (1) .. (3996)

<223>

| | | | | | | | | | | | | | | | | | | | |
|---|-----|--|--|-----|-----|-----|-----|-----|-----|-----|--|-----|-----|-----|--|--|-----|-----|-----|
| <400> | 1 | | | | | | | | | | | | | | | | | | |
| atg gca gct gcc tgg ctg gga tgg ctg ctc tgg gcc ctg ctc ctg agc | | | | | | | | | | | | | | | | | | | 48 |
| Met Ala Ala Ala Trp Leu Gly Trp Leu Leu Trp Ala Leu Leu Leu Ser | 1 | | | | 5 | | | | 10 | | | | | | | | | 15 | |
| gcg gcc cag ggt gag cta tac aca ccc aaa cac gaa gct ggg gtc tgc | | | | | | | | | | | | | | | | | | | 96 |
| Ala Ala Gln Gly Glu Leu Tyr Thr Pro Lys His Glu Ala Gly Val Cys | | | | 20 | | | | 25 | | | | | | 30 | | | | | |
| acc ttt tac gaa gag tgc ggg aaa aac cca gag ctc tct gga ggc ctc | | | | | | | | | | | | | | | | | | | 144 |
| Thr Phe Tyr Glu Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Gly Leu | | | | 35 | | | | 40 | | | | | | 45 | | | | | |
| acg tca cta tcc aat gta tcc tgc ctg tct aac acc ccg gcc cgc cac | | | | | | | | | | | | | | | | | | | 192 |
| Thr Ser Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg His | | | | | | | 55 | | | | | | 60 | | | | | | |
| gtc acg ggt gaa cac ctg gct ctt ctc cag cgc atc tgt ccc cgc ctg | | | | | | | | | | | | | | | | | | | 240 |
| Val Thr Gly Glu His Leu Ala Leu Leu Gln Arg Ile Cys Pro Arg Leu | 65 | | | | | 70 | | | | 75 | | | | | | | | 80 | |
| tac aac ggc ccc aat acc act ttt gcc tgt tgc tct acc aag cag ctg | | | | | | | | | | | | | | | | | | | 288 |
| Tyr Asn Gly Pro Asn Thr Thr Phe Ala Cys Cys Ser Thr Lys Gln Leu | | | | | 85 | | | | 90 | | | | | | | | 95 | | |
| ctg tcc tta gaa agc agc atg tcc atc acc aag gcc ctt ctc acg cgc | | | | | | | | | | | | | | | | | | | 336 |
| Leu Ser Leu Glu Ser Ser Met Ser Ile Thr Lys Ala Leu Leu Thr Arg | | | | 100 | | | | 105 | | | | | | 110 | | | | | |
| tgc ccg gcc tgc tct gac aat ttt gtg agc tta cac tgc cac aac act | | | | | | | | | | | | | | | | | | | 384 |
| Cys Pro Ala Cys Ser Asp Asn Phe Val Ser Leu His Cys His Asn Thr | | | | 115 | | | | 120 | | | | | 125 | | | | | | |
| tgc agc cct gac cag agc ctc ttc atc aac gtc acc ccg gtg gtt gag | | | | | | | | | | | | | | | | | | | 432 |
| Cys Ser Pro Asp Gln Ser Leu Phe Ile Asn Val Thr Arg Val Val Glu | | | | | | | 135 | | | | | 140 | | | | | | | |
| cgg ggc gct gga gag cct cct gcc gtg gtg gcc tat gag gcc ttt tat | | | | | | | | | | | | | | | | | | | 480 |
| Arg Gly Ala Gly Glu Pro Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr | 145 | | | | | 150 | | | | 155 | | | | | | | | 160 | |
| cag cgc agc ttt gct gag aag gcc tat gag tcc tgc agc cag gtg cgc | | | | | | | | | | | | | | | | | | | 528 |
| Gln Arg Ser Phe Ala Glu Lys Ala Tyr Glu Ser Cys Ser Gln Val Arg | | | | | 165 | | | | 170 | | | | | | | | 175 | | |
| atc cct gcg gcc gct tcc ttg gcc gtg ggc agc atg tgt gga gtg tat | | | | | | | | | | | | | | | | | | | 576 |
| Ile Pro Ala Ala Ala Ser Leu Ala Val Gly Ser Met Cys Gly Val Tyr | | | | 180 | | | | 185 | | | | | 190 | | | | | | |
| ggc tcc gcc ctc tgc aat gct cag cgc tgg ctc aac ttc caa gga gac | | | | | | | | | | | | | | | | | | | 624 |
| Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp | | | | | | | 200 | | | | | 205 | | | | | | | |
| aca ggg aat ggc ctg gct ccg ctg gat atc acc ttc cac ctc ttg gag | | | | | | | | | | | | | | | | | | | 672 |
| Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu | | | | | | 215 | | | | | | 220 | | | | | | | |
| cct ggc cag gcc cta ccg gat ggg atc cag cca ctg aat ggg aag atc | | | | | | | | | | | | | | | | | | | 720 |
| Pro Gly Gln Ala Leu Pro Asp Gly Ile Gln Pro Leu Asn Gly Lys Ile | | | | | | | | | | | | | | | | | | | |

| 225 | | 230 | | 235 | | 240 | |
|---|--|-----|--|-----|--|-----|------|
| gca ccc tgc aac gag tct cag ggt gat gac tca gca gtc tgc tcc tgc | | | | | | | 768 |
| Ala Pro Cys Asn Glu Ser Gln Gly Asp Asp Ser Ala Val Cys Ser Cys | | | | | | | |
| | | 245 | | 250 | | 255 | |
| cag gac tgt gcg gcg tcc tgc cct gtc atc cct ccg ccc gag gcc ttg | | | | | | | 816 |
| Gln Asp Cys Ala Ala Ser Cys Pro Val Ile Pro Pro Pro Glu Ala Leu | | | | | | | |
| | | 260 | | 265 | | 270 | |
| cgc cct tcc ttc tac atg ggt cgc atg cca ggc tgg ctg gcc ctc atc | | | | | | | 864 |
| Arg Pro Ser Phe Tyr Met Gly Arg Met Pro Gly Trp Leu Ala Leu Ile | | | | | | | |
| | | 275 | | 280 | | 285 | |
| atc atc ttc act gct gtc ttt gtg ttg ctc tct gca gtc ctt gtg cgt | | | | | | | 912 |
| Ile Ile Phe Thr Ala Val Phe Val Leu Leu Ser Ala Val Leu Val Arg | | | | | | | |
| | | 290 | | 295 | | 300 | |
| ctc cga gtg gtt tcc aac agg aac aag aac aag gca gaa ggc ccc cag | | | | | | | 960 |
| Leu Arg Val Val Ser Asn Arg Asn Lys Asn Lys Ala Glu Gly Pro Gln | | | | | | | |
| | | 305 | | 310 | | 315 | 320 |
| gaa gcc ccc aaa ctc cct cat aag cac aaa ctc tca ccc cat acc atc | | | | | | | 1008 |
| Glu Ala Pro Lys Leu Pro His Lys His Lys Leu Ser Pro His Thr Ile | | | | | | | |
| | | 325 | | 330 | | 335 | |
| ctg ggc cgg ttc ttc cag aac tgg ggc aca agg gtg gcc tcg tgg cca | | | | | | | 1056 |
| Leu Gly Arg Phe Phe Gln Asn Trp Gly Thr Arg Val Ala Ser Trp Pro | | | | | | | |
| | | 340 | | 345 | | 350 | |
| ctc acc gtc tta gca ctg tcc ttc atc gtt gtg ata gcc tta gca gca | | | | | | | 1104 |
| Leu Thr Val Leu Ala Leu Ser Phe Ile Val Val Ile Ala Leu Ala Ala | | | | | | | |
| | | 355 | | 360 | | 365 | |
| ggc ctg acc ttt att gaa ctc acc aca gac cct gtg gaa ctg tgg tcg | | | | | | | 1152 |
| Gly Leu Thr Phe Ile Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser | | | | | | | |
| | | 370 | | 375 | | 380 | |
| gcc ccc aag agc cag gcc cgg aaa gag aag tct ttc cat gat gag cat | | | | | | | 1200 |
| Ala Pro Lys Ser Gln Ala Arg Lys Glu Lys Ser Phe His Asp Glu His | | | | | | | |
| | | 385 | | 390 | | 395 | 400 |
| ttc ggc ccc ttc ttt cga acc aac cag att ttc gtg aca gct cgg aac | | | | | | | 1248 |
| Phe Gly Pro Phe Phe Arg Thr Asn Gln Ile Phe Val Thr Ala Arg Asn | | | | | | | |
| | | 405 | | 410 | | 415 | |
| agg tcc agc tac aag tac gac tcc cta ctg cta ggg tcc aag aac ttc | | | | | | | 1296 |
| Arg Ser Ser Tyr Lys Tyr Asp Ser Leu Leu Leu Gly Ser Lys Asn Phe | | | | | | | |
| | | 420 | | 425 | | 430 | |
| agt ggg atc ctg tcc ctg gac ttc ctg ctg gag ctg ctg gag ctt cag | | | | | | | 1344 |
| Ser Gly Ile Leu Ser Leu Asp Phe Leu Leu Glu Leu Leu Glu Leu Gln | | | | | | | |
| | | 435 | | 440 | | 445 | |
| gag agg ctt cga cac ctg caa gtg tgg tcc cct gag gca gag cgc aac | | | | | | | 1392 |
| Glu Arg Leu Arg His Leu Gln Val Trp Ser Pro Glu Ala Glu Arg Asn | | | | | | | |
| | | 450 | | 455 | | 460 | |
| atc tcc ctc cag gac atc tgc tat gcc ccc ctc aac cca tat aac acc | | | | | | | 1440 |
| Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Tyr Asn Thr | | | | | | | |
| | | 465 | | 470 | | 475 | 480 |

| | |
|---|------|
| agc ctc tcc gac tgc tgt gtc aac agc ctc ctt cag tac ttc cag aac Ser Leu Ser Asp Cys Cys Val Asn Ser Leu Leu Gln Tyr Phe Gln Asn 485 490 495 | 1488 |
| aac cgc acc ctc ctg atg ctc acg gcc aac cag act ctg aat ggc cag Asn Arg Thr Leu Leu Met Leu Thr Ala Asn Gln Thr Leu Asn Gly Gln 500 505 510 | 1536 |
| acc tcc ctg gtg gac tgg aag gac cat ttc ctc tac tgt gca aat gcc Thr Ser Leu Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala 515 520 525 | 1584 |
| cct ctc acg ttc aaa gat ggc acg tct ctg gcc ctg agc tgc atg gct Pro Leu Thr Phe Lys Asp Gly Thr Ser Leu Ala Leu Ser Cys Met Ala 530 535 540 | 1632 |
| gac tac ggg gct cct gtc ttc ccc ttc ctt gct gtt ggg gga tac caa Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Val Gly Gly Tyr Gln 545 550 555 560 | 1680 |
| ggc acg gac tat tcc gag gca gaa gcg ctg atc ata acc ttc tct ctc Gly Thr Asp Tyr Ser Glu Ala Glu Ala Leu Ile Ile Thr Phe Ser Leu 565 570 575 | 1728 |
| aat aac tac ccc gct gat gat ccc cgc atg gcc cag gcc aag ctc tgg Asn Asn Tyr Pro Ala Asp Asp Pro Arg Met Ala Gln Ala Lys Leu Trp 580 585 590 | 1776 |
| gag gag gct ttc ttg aag gaa atg gaa tcc ttc cag agg aac aca agt Glu Glu Ala Phe Leu Lys Glu Met Glu Ser Phe Gln Arg Asn Thr Ser 595 600 605 | 1824 |
| gac aag ttc cag gtt gcg ttc tca gct gag cgc tct ctg gag gat gag Asp Lys Phe Gln Val Ala Phe Ser Ala Glu Arg Ser Leu Glu Asp Glu 610 615 620 | 1872 |
| atc aac cgc acc acc atc cag gac ctg cct gtc ttt gcc gtc agc tac Ile Asn Arg Thr Thr Ile Gln Asp Leu Pro Val Phe Ala Val Ser Tyr 625 630 635 640 | 1920 |
| att atc gtc ttc ctg tac atc tcc ctg gcc ctg ggc agc tac tcc aga Ile Ile Val Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Arg 645 650 655 | 1968 |
| tgc agc cga gta gcg gtg gag tcc aag gct act ctg ggc cta ggt ggg Cys Ser Arg Val Ala Val Glu Ser Lys Ala Thr Leu Gly Leu Gly Gly 660 665 670 | 2016 |
| gtg att gtt gtg ctg gga gca gtt ctg gct gcc atg ggc ttc tac tcc Val Ile Val Val Leu Gly Ala Val Leu Ala Ala Met Gly Phe Tyr Ser 675 680 685 | 2064 |
| tac ctg ggt gtc ccc tct tct ctg gtt atc atc caa gtg gta cct ttc Tyr Leu Gly Val Pro Ser Ser Leu Val Ile Ile Gln Val Val Pro Phe 690 695 700 | 2112 |
| ctg gtg cta gct gtg gga gct gac aac atc ttc atc ttt gtt ctt gag Leu Val Leu Ala Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu 705 710 715 720 | 2160 |

| | |
|---|------|
| tac cag agg cta cct agg atg cct ggg gaa cag cga gag gct cac att | 2208 |
| Tyr Gln Arg Leu Pro Arg Met Pro Gly Glu Gln Arg Glu Ala His Ile | |
| 725 730 735 | |
| ggc cgc acc ctg ggc agt gtg gcc ccc agc atg ctg ctg tgc agc ctc | 2256 |
| Gly Arg Thr Leu Gly Ser Val Ala Pro Ser Met Leu Leu Cys Ser Leu | |
| 740 745 750 | |
| tct gag gcc atc tgc ttc ttt cta ggg gcc ctg acc ccc atg cca gct | 2304 |
| Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Pro Met Pro Ala | |
| 755 760 765 | |
| gtg agg acc ttc gcc ttg acc tct ggc tta gca att atc ctc gac ttc | 2352 |
| Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Ile Ile Leu Asp Phe | |
| 770 775 780 | |
| ctg ctc cag atg act gcc ttt gtg gcc ctg ctc tcc ctg gat agc aag | 2400 |
| Leu Leu Gln Met Thr Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys | |
| 785 790 795 800 | |
| agg cag gag gcc tct cgc ccg gat gtc tta tgc tgc ttt tca acc cgg | 2448 |
| Arg Gln Glu Ala Ser Arg Pro Asp Val Leu Cys Cys Phe Ser Thr Arg | |
| 805 810 815 | |
| aag ctg ccc cca cct aaa gaa aaa gaa ggc ctc tta ctc cgc ttc ttc | 2496 |
| Lys Leu Pro Pro Pro Lys Glu Lys Glu Gly Leu Leu Leu Arg Phe Phe | |
| 820 825 830 | |
| cgc aag ata tac gct cct ttc ctg ctg cac aga ttc atc cgc cct gtt | 2544 |
| Arg Lys Ile Tyr Ala Pro Phe Leu Leu His Arg Phe Ile Arg Pro Val | |
| 835 840 845 | |
| gtg atg ctg ctg ttt ctg acc ctg ttt gga gca aat ctc tac tta atg | 2592 |
| Val Met Leu Leu Phe Leu Thr Leu Phe Gly Ala Asn Leu Tyr Leu Met | |
| 850 855 860 | |
| tgc aac atc aac gtg ggg cta gac cag gag ctg gct ctg ccc aag gac | 2640 |
| Cys Asn Ile Asn Val Gly Leu Asp Gln Glu Leu Ala Leu Pro Lys Asp | |
| 865 870 875 880 | |
| tcg tac ttg ata gac tac ttc ctc ttt ctg aac cga tac ctt gaa gtg | 2688 |
| Ser Tyr Leu Ile Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Leu Glu Val | |
| 885 890 895 | |
| ggg cct cca gtg tac ttt gtc acc acc tcg ggc ttc aac ttc tcc agc | 2736 |
| Gly Pro Pro Val Tyr Phe Val Thr Thr Ser Gly Phe Asn Phe Ser Ser | |
| 900 905 910 | |
| gag gca ggc atg aac gcc act tgc tct agc gca ggc tgt aag agc ttc | 2784 |
| Glu Ala Gly Met Asn Ala Thr Cys Ser Ser Ala Gly Cys Lys Ser Phe | |
| 915 920 925 | |
| tcc cta acc cag aaa atc cag tat gcc agt gaa ttc cct gac cag tct | 2832 |
| Ser Leu Thr Gln Lys Ile Gln Tyr Ala Ser Glu Phe Pro Asp Gln Ser | |
| 930 935 940 | |
| tac gtg gct att gct gca tcc tcc tgg gta gat gac ttc atc gac tgg | 2880 |
| Tyr Val Ala Ile Ala Ala Ser Ser Trp Val Asp Asp Phe Ile Asp Trp | |
| 945 950 955 960 | |
| ctg acc ccg tcc tcc tcc tgc tgt cgc ctt tat ata cgt ggc ccc cat | 2928 |

| | |
|---|------|
| Leu Thr Pro Ser Ser Ser Cys Cys Arg Leu Tyr Ile Arg Gly Pro His | |
| 965 970 975 | |
| aag gat gag ttc tgt ccc tca acg gat act tcc ttc aac tgc tta aaa | 2976 |
| Lys Asp Glu Phe Cys Pro Ser Thr Asp Thr Ser Phe Asn Cys Leu Lys | |
| 980 985 990 | |
| aac tgc atg aac cgc act ctg ggt cct gtg agg ccc aca gcg gaa cag | 3024 |
| Asn Cys Met Asn Arg Thr Leu Gly Pro Val Arg Pro Thr Ala Glu Gln | |
| 995 1000 1005 | |
| ttt cat aag tac ctg ccc tgg ttc ctg aat gat ccg ccc aat atc | 3069 |
| Phe His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Pro Pro Asn Ile | |
| 1010 1015 1020 | |
| aga tgt ccc aaa ggg ggt cta gca gcg tat aga acg tct gtg aat | 3114 |
| Arg Cys Pro Lys Gly Gly Leu Ala Ala Tyr Arg Thr Ser Val Asn | |
| 1025 1030 1035 | |
| ttg agc tca gat ggc cag gtt ata gcc tcc cag ttc atg gcc tac | 3159 |
| Leu Ser Ser Asp Gly Gln Val Ile Ala Ser Gln Phe Met Ala Tyr | |
| 1040 1045 1050 | |
| cac aag ccc tta agg aac tca cag gac ttc aca gaa gct ctc cgg | 3204 |
| His Lys Pro Leu Arg Asn Ser Gln Asp Phe Thr Glu Ala Leu Arg | |
| 1055 1060 1065 | |
| gcg tcc cgg ttg cta gca gcc aac atc aca gct gac cta cgg aag | 3249 |
| Ala Ser Arg Leu Leu Ala Ala Asn Ile Thr Ala Asp Leu Arg Lys | |
| 1070 1075 1080 | |
| gtg cct ggg aca gat cca aac ttt gag gtc ttc cct tac acg atc | 3294 |
| Val Pro Gly Thr Asp Pro Asn Phe Glu Val Phe Pro Tyr Thr Ile | |
| 1085 1090 1095 | |
| tcc aac gtg ttc tac cag caa tac ctg acg gtc ctt cct gag gga | 3339 |
| Ser Asn Val Phe Tyr Gln Gln Tyr Leu Thr Val Leu Pro Glu Gly | |
| 1100 1105 1110 | |
| atc ttc acc ctt gct ctt tgc ttt gtg ccc acc ttt gtt gtc tgc | 3384 |
| Ile Phe Thr Leu Ala Leu Cys Phe Val Pro Thr Phe Val Val Cys | |
| 1115 1120 1125 | |
| tac ctc cta ctg ggc ctg gac atg tgc tca ggg atc ctc aac cta | 3429 |
| Tyr Leu Leu Leu Gly Leu Asp Met Cys Ser Gly Ile Leu Asn Leu | |
| 1130 1135 1140 | |
| ctc tcc atc att atg att ctc gtg gac acc att ggc ctc atg gct | 3474 |
| Leu Ser Ile Ile Met Ile Leu Val Asp Thr Ile Gly Leu Met Ala | |
| 1145 1150 1155 | |
| gtg tgg ggt atc agc tat aat gcg gta tcc ctc atc aac ctt gtc | 3519 |
| Val Trp Gly Ile Ser Tyr Asn Ala Val Ser Leu Ile Asn Leu Val | |
| 1160 1165 1170 | |
| acg gca gtg ggc atg tct gtg gag ttt gtg tcc cac atc act cgg | 3564 |
| Thr Ala Val Gly Met Ser Val Glu Phe Val Ser His Ile Thr Arg | |
| 1175 1180 1185 | |
| tcc ttt gct gta agc acc aag cct acc cgg ctg gag agg gct aaa | 3609 |
| Ser Phe Ala Val Ser Thr Lys Pro Thr Arg Leu Glu Arg Ala Lys | |

| 1190 | 1195 | 1200 | |
|--|--|--|------|
| gat gct act gtc ttc atg ggc Asp Ala Thr Val Phe Met Gly 1205 | agc gcg gtg ttt gct Ser Ala Val Phe Ala 1210 | gga gtg gcc Gly Val Ala 1215 | 3654 |
| atg acc aac ttc cca ggc Met Thr Asn Phe Pro Gly 1220 | atc ctc atc ttg ggc Ile Leu Ile Leu Gly 1225 | ttt gcc caa gcc Phe Ala Gln Ala 1230 | 3699 |
| cag ctt att cag atc ttc ttc Gln Leu Ile Gln Ile Phe Phe 1235 | ttc cgc ctc aac ctt Phe Arg Leu Asn Leu 1240 | ctg atc acc Leu Ile Thr 1245 | 3744 |
| ttg ctg ggt ctg ctg cat ggc Leu Leu Gly Leu Leu His Gly 1250 | ctg gtc ttc ctg ccg Leu Val Phe Leu Pro 1255 | ggt gtc ctc Val Val Leu 1260 | 3789 |
| agc tat ctg gga cca gat gtt Ser Tyr Leu Gly Pro Asp Val 1265 | aac caa gct ctg gta Asn Gln Ala Leu Val 1270 | cag gag gag Gln Glu Glu 1275 | 3834 |
| aaa cta gcc agc gag gca gca Lys Leu Ala Ser Glu Ala Ala 1280 | gtg gcc cca gag cct Val Ala Pro Glu Pro 1285 | tct tgc cca Ser Cys Pro 1290 | 3879 |
| cag tac ccc tcc cct gct gat Gln Tyr Pro Ser Pro Ala Asp 1295 | gcg gat gcc aat gtt Ala Asp Ala Asn Val 1300 | aac tac ggc Asn Tyr Gly 1305 | 3924 |
| ttt gcc cca gaa ctt gcc cac Phe Ala Pro Glu Leu Ala His 1310 | gga gct aat gct gct Gly Ala Asn Ala Ala 1315 | aga agc tct Arg Ser Ser 1320 | 3969 |
| ttg ccc aaa agt gac caa aag Leu Pro Lys Ser Asp Gln Lys 1325 | ttc taa Phe 1330 | | 3996 |

<210> 2

<211> 1331

<212> PRT

<213> Rattus sp.

<400> 2

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Ala | Ala | Trp | Leu | Gly | Trp | Leu | Leu | Trp | Ala | Leu | Leu | Leu | Ser |
| 1 | | | | 5 | | | | 10 | | | | | 15 | | |
| Ala | Ala | Gln | Gly | Glu | Leu | Tyr | Thr | Pro | Lys | His | Glu | Ala | Gly | Val | Cys |
| | | 20 | | | | | | 25 | | | | | 30 | | |
| Thr | Phe | Tyr | Glu | Glu | Cys | Gly | Lys | Asn | Pro | Glu | Leu | Ser | Gly | Gly | Leu |
| | | 35 | | | | | 40 | | | | | 45 | | | |

Ile Ile Phe Thr Ala Val Phe Val Leu Leu Ser Ala Val Leu Val Arg
 290 295 300

Leu Arg Val Val Ser Asn Arg Asn Lys Asn Lys Ala Glu Gly Pro Gln
 305 310 315 320

Glu Ala Pro Lys Leu Pro His Lys His Lys Leu Ser Pro His Thr Ile
 325 330 335

Leu Gly Arg Phe Phe Gln Asn Trp Gly Thr Arg Val Ala Ser Trp Pro
 340 345 350

Leu Thr Val Leu Ala Leu Ser Phe Ile Val Val Ile Ala Leu Ala Ala
 355 360 365

Gly Leu Thr Phe Ile Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser
 370 375 380

Ala Pro Lys Ser Gln Ala Arg Lys Glu Lys Ser Phe His Asp Glu His
 385 390 395 400

Phe Gly Pro Phe Phe Arg Thr Asn Gln Ile Phe Val Thr Ala Arg Asn
 405 410 415

Arg Ser Ser Tyr Lys Tyr Asp Ser Leu Leu Leu Gly Ser Lys Asn Phe
 420 425 430

Ser Gly Ile Leu Ser Leu Asp Phe Leu Leu Glu Leu Leu Glu Leu Gln
 435 440 445

Glu Arg Leu Arg His Leu Gln Val Trp Ser Pro Glu Ala Glu Arg Asn
 450 455 460

Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Tyr Asn Thr
 465 470 475 480

Ser Leu Ser Asp Cys Cys Val Asn Ser Leu Leu Gln Tyr Phe Gln Asn
 485 490 495

Asn Arg Thr Leu Leu Met Leu Thr Ala Asn Gln Thr Leu Asn Gly Gln
 500 505 510

Thr Ser Leu Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala
 515 520 525

Pro Leu Thr Phe Lys Asp Gly Thr Ser Leu Ala Leu Ser Cys Met Ala
 530 535 540

Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Val Gly Gly Tyr Gln
 545 550 555 560

Gly Thr Asp Tyr Ser Glu Ala Glu Ala Leu Ile Ile Thr Phe Ser Leu
 565 570 575

Asn Asn Tyr Pro Ala Asp Asp Pro Arg Met Ala Gln Ala Lys Leu Trp
 580 585 590

Glu Glu Ala Phe Leu Lys Glu Met Glu Ser Phe Gln Arg Asn Thr Ser
 595 600 605

Asp Lys Phe Gln Val Ala Phe Ser Ala Glu Arg Ser Leu Glu Asp Glu
 610 615 620

Ile Asn Arg Thr Thr Ile Gln Asp Leu Pro Val Phe Ala Val Ser Tyr
 625 630 635 640

Ile Ile Val Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Arg
 645 650 655

Cys Ser Arg Val Ala Val Glu Ser Lys Ala Thr Leu Gly Leu Gly Gly
 660 665 670

Val Ile Val Val Leu Gly Ala Val Leu Ala Ala Met Gly Phe Tyr Ser
 675 680 685

Tyr Leu Gly Val Pro Ser Ser Leu Val Ile Ile Gln Val Val Pro Phe
 690 695 700

Leu Val Leu Ala Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu
 705 710 715 720

Tyr Gln Arg Leu Pro Arg Met Pro Gly Glu Gln Arg Glu Ala His Ile
 725 730 735

Gly Arg Thr Leu Gly Ser Val Ala Pro Ser Met Leu Leu Cys Ser Leu
 740 745 750

Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Pro Met Pro Ala
 755 760 765

Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Ile Ile Leu Asp Phe

| | | | | | | | | | | | | | | |
|------|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|
| Arg | Cys | Pro | Lys | Gly | Gly | Leu | Ala | Ala | Tyr | Arg | Thr | Ser | Val | Asn |
| 1025 | | | | | | 1030 | | | | | 1035 | | | |
| Leu | Ser | Ser | Asp | Gly | Gln | Val | Ile | Ala | Ser | Gln | Phe | Met | Ala | Tyr |
| 1040 | | | | | | 1045 | | | | | 1050 | | | |
| His | Lys | Pro | Leu | Arg | Asn | Ser | Gln | Asp | Phe | Thr | Glu | Ala | Leu | Arg |
| 1055 | | | | | | 1060 | | | | | 1065 | | | |
| Ala | Ser | Arg | Leu | Leu | Ala | Ala | Asn | Ile | Thr | Ala | Asp | Leu | Arg | Lys |
| 1070 | | | | | | 1075 | | | | | 1080 | | | |
| Val | Pro | Gly | Thr | Asp | Pro | Asn | Phe | Glu | Val | Phe | Pro | Tyr | Thr | Ile |
| 1085 | | | | | | 1090 | | | | | 1095 | | | |
| Ser | Asn | Val | Phe | Tyr | Gln | Gln | Tyr | Leu | Thr | Val | Leu | Pro | Glu | Gly |
| 1100 | | | | | | 1105 | | | | | 1110 | | | |
| Ile | Phe | Thr | Leu | Ala | Leu | Cys | Phe | Val | Pro | Thr | Phe | Val | Val | Cys |
| 1115 | | | | | | 1120 | | | | | 1125 | | | |
| Tyr | Leu | Leu | Leu | Gly | Leu | Asp | Met | Cys | Ser | Gly | Ile | Leu | Asn | Leu |
| 1130 | | | | | | 1135 | | | | | 1140 | | | |
| Leu | Ser | Ile | Ile | Met | Ile | Leu | Val | Asp | Thr | Ile | Gly | Leu | Met | Ala |
| 1145 | | | | | | 1150 | | | | | 1155 | | | |
| Val | Trp | Gly | Ile | Ser | Tyr | Asn | Ala | Val | Ser | Leu | Ile | Asn | Leu | Val |
| 1160 | | | | | | 1165 | | | | | 1170 | | | |
| Thr | Ala | Val | Gly | Met | Ser | Val | Glu | Phe | Val | Ser | His | Ile | Thr | Arg |
| 1175 | | | | | | 1180 | | | | | 1185 | | | |
| Ser | Phe | Ala | Val | Ser | Thr | Lys | Pro | Thr | Arg | Leu | Glu | Arg | Ala | Lys |
| 1190 | | | | | | 1195 | | | | | 1200 | | | |
| Asp | Ala | Thr | Val | Phe | Met | Gly | Ser | Ala | Val | Phe | Ala | Gly | Val | Ala |
| 1205 | | | | | | 1210 | | | | | 1215 | | | |
| Met | Thr | Asn | Phe | Pro | Gly | Ile | Leu | Ile | Leu | Gly | Phe | Ala | Gln | Ala |
| 1220 | | | | | | 1225 | | | | | 1230 | | | |
| Gln | Leu | Ile | Gln | Ile | Phe | Phe | Phe | Arg | Leu | Asn | Leu | Leu | Ile | Thr |
| 1235 | | | | | | 1240 | | | | | 1245 | | | |

Leu Leu Gly Leu Leu His Gly Leu Val Phe Leu Pro Val Val Leu
1250 1255 1260

Ser Tyr Leu Gly Pro Asp Val Asn Gln Ala Leu Val Gln Glu Glu
1265 1270 1275

Lys Leu Ala Ser Glu Ala Ala Val Ala Pro Glu Pro Ser Cys Pro
1280 1285 1290

Gln Tyr Pro Ser Pro Ala Asp Ala Asp Ala Asn Val Asn Tyr Gly
1295 1300 1305

Phe Ala Pro Glu Leu Ala His Gly Ala Asn Ala Ala Arg Ser Ser
1310 1315 1320

Leu Pro Lys Ser Asp Gln Lys Phe
1325 1330

<210> 3

<211> 3999

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (1) .. (3999)

<223>

<400> 3
atg gcg gag gcc ggc ctg agg ggc tgg ctg ctg tgg gcc ctg ctc ctg 48
Met Ala Glu Ala Gly Leu Arg Gly Trp Leu Leu Trp Ala Leu Leu Leu
1 5 10 15
cgc ttg gcc cag agt gag cct tac aca acc atc cac cag cct ggc tac 96
Arg Leu Ala Gln Ser Glu Pro Tyr Thr Thr Ile His Gln Pro Gly Tyr
20 25 30
tgc gcc ttc tat gac gaa tgt ggg aag aac cca gag ctg tct gga agc 144
Cys Ala Phe Tyr Asp Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Ser
35 40 45
ctc atg aca ctc tcc aac gtg tcc tgc ctg tcc aac acg ccg gcc cgc 192
Leu Met Thr Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg
50 55 60

| | |
|---|-----|
| aag atc aca ggt gat cac ctg atc cta tta cag aag atc tgc ccc cgc | 240 |
| Lys Ile Thr Gly Asp His Leu Ile Leu Leu Gln Lys Ile Cys Pro Arg | |
| 65 70 75 80 | |
| ctc tac acc ggc ccc aac acc caa gcc tgc tgc tcc gcc aag cag ctg | 288 |
| Leu Tyr Thr Gly Pro Asn Thr Gln Ala Cys Cys Ser Ala Lys Gln Leu | |
| 85 90 95 | |
| gta tca ctg gaa gcg agt ctg tcg atc acc aag gcc ctc ctc acc cgc | 336 |
| Val Ser Leu Glu Ala Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg | |
| 100 105 110 | |
| tgc cca gcc tgc tct gac aat ttt gtg aac ctg cac tgc cac aac acg | 384 |
| Cys Pro Ala Cys Ser Asp Asn Phe Val Asn Leu His Cys His Asn Thr | |
| 115 120 125 | |
| tgc agc ccc aat cag agc ctc ttc atc aat gtg acc cgc gtg gcc cag | 432 |
| Cys Ser Pro Asn Gln Ser Leu Phe Ile Asn Val Thr Arg Val Ala Gln | |
| 130 135 140 | |
| cta ggg gct gga caa ctc cca gct gtg gtg gcc tat gag gcc ttc tac | 480 |
| Leu Gly Ala Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr | |
| 145 150 155 160 | |
| cag cat agc ttt gcc gag cag agc tat gac tcc tgc agc cgt gtg cgc | 528 |
| Gln His Ser Phe Ala Glu Gln Ser Tyr Asp Ser Cys Ser Arg Val Arg | |
| 165 170 175 | |
| gtc cct gca gct gcc acg ctg gct gtg ggc acc atg tgt ggc gtg tat | 576 |
| Val Pro Ala Ala Ala Thr Leu Ala Val Gly Thr Met Cys Gly Val Tyr | |
| 180 185 190 | |
| ggc tct gcc ctt tgc aat gcc cag cgc tgg ctc aac ttc cag gga gac | 624 |
| Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp | |
| 195 200 205 | |
| aca ggc aat ggt ctg gcc cca ctg gac atc acc ttc cac ctc ttg gag | 672 |
| Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu | |
| 210 215 220 | |
| cct ggc cag gcc gtg ggg agt ggg att cag cct ctg aat gag ggg gtt | 720 |
| Pro Gly Gln Ala Val Gly Ser Gly Ile Gln Pro Leu Asn Glu Gly Val | |
| 225 230 235 240 | |
| gca cgt tgc aat gag tcc caa ggt gac gac gtg gcg acc tgc tcc tgc | 768 |
| Ala Arg Cys Asn Glu Ser Gln Gly Asp Asp Val Ala Thr Cys Ser Cys | |
| 245 250 255 | |
| caa gac tgt gct gca tcc tgt cct gcc ata gcc cgc ccc cag gcc ctc | 816 |
| Gln Asp Cys Ala Ala Ser Cys Pro Ala Ile Ala Arg Pro Gln Ala Leu | |
| 260 265 270 | |
| gac tcc acc ttc tac ctg ggc cag atg ccg ggc agt ctg gtc ctc atc | 864 |
| Asp Ser Thr Phe Tyr Leu Gly Gln Met Pro Gly Ser Leu Val Leu Ile | |
| 275 280 285 | |
| atc atc ctc tgc tct gtc ttc gct gtg gtc acc atc ctg ctt gtg gga | 912 |
| Ile Ile Leu Cys Ser Val Phe Ala Val Val Thr Ile Leu Leu Val Gly | |
| 290 295 300 | |

| | |
|---|------|
| ttc cgt gtg gcc ccc gcc agg gac aaa agc aag atg gtg gac ccc aag Phe Arg Val Ala Pro Ala Arg Asp Lys Ser Lys Met Val Asp Pro Lys 305 310 315 320 | 960 |
| aag ggc acc agc ctc tct gac aag ctc agc ttc tcc acc cac acc ctc Lys Gly Thr Ser Leu Ser Asp Lys Leu Ser Phe Ser Thr His Thr Leu 325 330 335 | 1008 |
| ctt ggc cag ttc ttc cag ggc tgg ggc acg tgg gtg gct tcg tgg cct Leu Gly Gln Phe Phe Gln Gly Trp Gly Thr Trp Val Ala Ser Trp Pro 340 345 350 | 1056 |
| ctg acc atc ttg gtg cta tct gtc atc ccg gtg gtg gcc ttg gca gcg Leu Thr Ile Leu Val Leu Ser Val Ile Pro Val Val Ala Leu Ala Ala 355 360 365 | 1104 |
| ggc ctg gtc ttt aca gaa ctc act acg gac ccc gtg gag ctg tgg tcg Gly Leu Val Phe Thr Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser 370 375 380 | 1152 |
| gcc ccc aac agc caa gcc cgg agt gag aaa gct ttc cat gac cag cat Ala Pro Asn Ser Gln Ala Arg Ser Glu Lys Ala Phe His Asp Gln His 385 390 395 400 | 1200 |
| ttc ggc ccc ttc ttc cga acc aac cag gtg atc ctg acg gct cct aac Phe Gly Pro Phe Phe Arg Thr Asn Gln Val Ile Leu Thr Ala Pro Asn 405 410 415 | 1248 |
| cgg tcc agc tac agg tat gac tct ctg ctg ctg ggg ccc aag aac ttc Arg Ser Ser Tyr Arg Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe 420 425 430 | 1296 |
| agc gga atc ctg gac ctg gac ttg ctg ctg gag ctg cta gag ctg cag Ser Gly Ile Leu Asp Leu Asp Leu Leu Leu Glu Leu Leu Glu Leu Gln 435 440 445 | 1344 |
| gag agg ctg cgg cac ctc cag gta tgg tcg ccc gaa gca cag cgc aac Glu Arg Leu Arg His Leu Gln Val Trp Ser Pro Glu Ala Gln Arg Asn 450 455 460 | 1392 |
| atc tcc ctg cag gac atc tgc tac gcc ccc ctc aat ccg gac aat acc Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Asp Asn Thr 465 470 475 480 | 1440 |
| agt ctc tac gac tgc tgc atc aac agc ctc ctg cag tat ttc cag aac Ser Leu Tyr Asp Cys Cys Ile Asn Ser Leu Leu Gln Tyr Phe Gln Asn 485 490 495 | 1488 |
| aac cgc acg ctc ctg ctg ctc aca gcc aac cag aca ctg atg ggg cag Asn Arg Thr Leu Leu Leu Leu Thr Ala Asn Gln Thr Leu Met Gly Gln 500 505 510 | 1536 |
| acc tcc caa gtc gac tgg aag gac cat ttt ctg tac tgt gcc aat gcc Thr Ser Gln Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala 515 520 525 | 1584 |
| ccg ctc acc ttc aag gat ggc aca gcc ctg gcc ctg agc tgc atg gct Pro Leu Thr Phe Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Met Ala 530 535 540 | 1632 |
| gac tac ggg gcc cct gtc ttc ccc ttc ctt gcc att ggg ggg tac aaa | 1680 |

| | | | | | | | | | | | | | | | | |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------|
| Asp 545 | Tyr | Gly | Ala | Pro | Val 550 | Phe | Pro | Phe | Leu | Ala 555 | Ile | Gly | Gly | Tyr | Lys 560 | |
| gga Gly | aag Lys | gac Asp | tat Tyr | tct Ser 565 | gag Glu | gca Ala | gag Glu | gcc Ala 570 | ctg Leu | atc Ile | atg Met | acg Thr | ttc Phe 575 | tcc Ser | ctc Leu | 1728 |
| aac Asn | aat Asn | tac Tyr | cct Pro 580 | gcc Ala | ggg Gly | gac Asp | ccc Pro | cgt Arg 585 | ctg Leu | gcc Ala | cag Gln | gcc Ala 590 | aag Lys | ctg Leu | tgg Trp | 1776 |
| gag Glu | gag Glu | gcc Ala 595 | ttc Phe | tta Leu | gag Glu | gaa Glu | atg Met 600 | cga Arg | gcc Ala | ttc Phe | cag Gln | cgt Arg 605 | cgg Arg | atg Met | gct Ala | 1824 |
| ggc Gly 610 | atg Met | ttc Phe | cag Gln | gtc Val | acg Thr | ttc Phe 615 | acg Thr | gct Ala | gag Glu | cgc Arg | tct Ser 620 | ctg Leu | gaa Glu | gac Asp | gag Glu | 1872 |
| atc Ile 625 | aat Asn | cgc Arg | acc Thr | aca Thr | gct Ala 630 | gaa Glu | gac Asp | ctg Leu | ccc Pro | atc Ile 635 | ttt Phe | gcc Ala | acc Thr | agc Ser | tac Tyr 640 | 1920 |
| att Ile | gtc Val | ata Ile | ttc Phe 645 | ctg Leu | tac Tyr | atc Ile | tct Ser | ctg Leu 650 | gcc Ala | ctg Leu | ggc Gly | agc Ser | tat Tyr | tcc Ser 655 | agc Ser | 1968 |
| tgg Trp | agc Ser | cga Arg | gtg Val 660 | atg Met | gtg Val | gac Asp | tcc Ser | aag Lys 665 | gcc Ala | acg Thr | ctg Leu | ggc Gly 670 | ctc Leu | ggc Gly | ggg Gly | 2016 |
| gtg Val | gcc Ala 675 | gtg Val | gtc Val | ctg Leu | gga Gly | gca Ala | gtc Val 680 | atg Met | gct Ala | gcc Ala | atg Met | ggc Gly 685 | ttc Phe | ttc Phe | tcc Ser | 2064 |
| tac Tyr 690 | ttg Leu | ggg Gly | atc Ile | cgc Arg | tcc Ser | tcc Ser | ctg Leu | gtc Val | atc Ile | ctg Leu | caa Gln 700 | gtg Val | ggt Val | cct Pro | ttc Phe | 2112 |
| ctg Leu 705 | gtg Val | ctg Leu | tcc Ser | gtg Val | ggg Gly 710 | gct Ala | gat Asp | aac Asn | atc Ile | ttc Phe 715 | atc Ile | ttt Phe | ggt Val | ctc Leu | gag Glu 720 | 2160 |
| tac Tyr | cag Gln | agg Arg | ctg Leu | ccc Pro 725 | cgg Arg | agg Arg | cct Pro | ggg Gly | gag Glu 730 | cca Pro | cga Arg | gag Glu | gtc Val | cac His 735 | att Ile | 2208 |
| ggg Gly | cga Arg | gcc Ala | cta Leu 740 | ggc Gly | agg Arg | gtg Val | gct Ala | ccc Pro 745 | agc Ser | atg Met | ctg Leu | ttg Leu | tgc Cys 750 | agc Ser | ctc Leu | 2256 |
| tct Ser | gag Glu | gcc Ala 755 | atc Ile | tgc Cys | ttc Phe | ttc Phe | cta Leu 760 | ggg Gly | gcc Ala | ctg Leu | acc Thr | ccc Pro 765 | atg Met | cca Pro | gct Ala | 2304 |
| gtg Val 770 | cgg Arg | acc Thr | ttt Phe | gcc Ala | ctg Leu | acc Thr | tct Ser 775 | ggc Gly | ctt Leu | gca Ala | gtg Val 780 | atc Ile | ctt Leu | gac Asp | ttc Phe | 2352 |
| ctc Leu | ctg Leu | cag Gln | atg Met | tca Ser | gcc Ala | ttt Phe | gtg Val | gcc Ala | ctg Leu | ctc Leu | tcc Ser | ctg Leu | gac Asp | agc Ser | aag Lys | 2400 |

| 785 | | 790 | | 795 | | 800 | |
|---|--|------|--|------|--|------|------|
| agg cag gag gcc tcc cgg ttg gac gtc tgc tgc tgt gtc aag ccc cag | | | | | | | 2448 |
| Arg Gln Glu Ala Ser Arg Leu Asp Val Cys Cys Cys Val Lys Pro Gln | | | | | | | |
| | | 805 | | 810 | | 815 | |
| gag ctg ccc ccg cct ggc cag gga gag ggg ctc ctg ctt ggc ttc ttc | | | | | | | 2496 |
| Glu Leu Pro Pro Pro Gly Gln Gly Glu Gly Leu Leu Leu Gly Phe Phe | | | | | | | |
| | | 820 | | 825 | | 830 | |
| caa aag gct tat gcc ccc ttc ctg ctg cac tgg atc act cga ggt gtt | | | | | | | 2544 |
| Gln Lys Ala Tyr Ala Pro Phe Leu Leu His Trp Ile Thr Arg Gly Val | | | | | | | |
| | | 835 | | 840 | | 845 | |
| gtg ctg ctg ctg ttt ctc gcc ctg ttc gga gtg agc ctc tac tcc atg | | | | | | | 2592 |
| Val Leu Leu Leu Phe Leu Ala Leu Phe Gly Val Ser Leu Tyr Ser Met | | | | | | | |
| | | 850 | | 855 | | 860 | |
| tgc cac atc agc gtg gga ctg gac cag gag ctg gcc ctg ccc aag gac | | | | | | | 2640 |
| Cys His Ile Ser Val Gly Leu Asp Gln Glu Leu Ala Leu Pro Lys Asp | | | | | | | |
| | | 865 | | 870 | | 875 | 880 |
| tcg tac ctg ctt gac tat ttc ctc ttt ctg aac cgc tac ttc gag gtg | | | | | | | 2688 |
| Ser Tyr Leu Leu Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Phe Glu Val | | | | | | | |
| | | 885 | | 890 | | 895 | |
| ggg gcc ccg gtg tac ttt gtt acc acc ttg ggc tac aac ttc tcc agc | | | | | | | 2736 |
| Gly Ala Pro Val Tyr Phe Val Thr Thr Leu Gly Tyr Asn Phe Ser Ser | | | | | | | |
| | | 900 | | 905 | | 910 | |
| gag gct ggg atg aat gcc atc tgc tcc agt gca ggc tgc aac aac ttc | | | | | | | 2784 |
| Glu Ala Gly Met Asn Ala Ile Cys Ser Ser Ala Gly Cys Asn Asn Phe | | | | | | | |
| | | 915 | | 920 | | 925 | |
| tcc ttc acc cag aag atc cag tat gcc aca gag ttc cct gag cag tct | | | | | | | 2832 |
| Ser Phe Thr Gln Lys Ile Gln Tyr Ala Thr Glu Phe Pro Glu Gln Ser | | | | | | | |
| | | 930 | | 935 | | 940 | |
| tac ctg gcc atc cct gcc tcc tcc tgg gtg gat gac ttc att gac tgg | | | | | | | 2880 |
| Tyr Leu Ala Ile Pro Ala Ser Ser Trp Val Asp Asp Phe Ile Asp Trp | | | | | | | |
| | | 945 | | 950 | | 955 | 960 |
| ctg acc ccg tcc tcc tgc tgc cgc ctt tat ata tct ggc ccc aat aag | | | | | | | 2928 |
| Leu Thr Pro Ser Ser Cys Cys Arg Leu Tyr Ile Ser Gly Pro Asn Lys | | | | | | | |
| | | 965 | | 970 | | 975 | |
| gac aag ttc tgc ccc tcg acc gtc aac tct ctg aac tgc cta aag aac | | | | | | | 2976 |
| Asp Lys Phe Cys Pro Ser Thr Val Asn Ser Leu Asn Cys Leu Lys Asn | | | | | | | |
| | | 980 | | 985 | | 990 | |
| tgc atg agc atc acg atg ggc tct gtg agg ccc tcg gtg gag cag ttc | | | | | | | 3024 |
| Cys Met Ser Ile Thr Met Gly Ser Val Arg Pro Ser Val Glu Gln Phe | | | | | | | |
| | | 995 | | 1000 | | 1005 | |
| cat aag tat ctt ccc tgg ttc ctg aac gac cgg ccc aac atc aaa | | | | | | | 3069 |
| His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Arg Pro Asn Ile Lys | | | | | | | |
| | | 1010 | | 1015 | | 1020 | |
| tgt ccc aaa ggc ggc ctg gca gca tac agc acc tct gtg aac ttg | | | | | | | 3114 |
| Cys Pro Lys Gly Gly Leu Ala Ala Tyr Ser Thr Ser Val Asn Leu | | | | | | | |
| | | 1025 | | 1030 | | 1035 | |

| | | | | | | | | | | | | | | | |
|-----|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|------|
| act | tca | gat | ggc | cag | gtt | tta | gcc | tcc | agg | ttc | atg | gcc | tat | cac | 3159 |
| Thr | Ser | Asp | Gly | Gln | Val | Leu | Ala | Ser | Arg | Phe | Met | Ala | Tyr | His | |
| | 1040 | | | | | 1045 | | | | | 1050 | | | | |
| aag | ccc | ctg | aaa | aac | tca | cag | gat | tac | aca | gaa | gct | ctg | cgg | gca | 3204 |
| Lys | Pro | Leu | Lys | Asn | Ser | Gln | Asp | Tyr | Thr | Glu | Ala | Leu | Arg | Ala | |
| | 1055 | | | | | 1060 | | | | | 1065 | | | | |
| gct | cga | gag | ctg | gca | gcc | aac | atc | act | gct | gac | ctg | cgg | aaa | gtg | 3249 |
| Ala | Arg | Glu | Leu | Ala | Ala | Asn | Ile | Thr | Ala | Asp | Leu | Arg | Lys | Val | |
| | 1070 | | | | | 1075 | | | | | 1080 | | | | |
| cct | gga | aca | gac | ccg | gct | ttt | gag | gtc | ttc | ccc | tac | acg | atc | acc | 3294 |
| Pro | Gly | Thr | Asp | Pro | Ala | Phe | Glu | Val | Phe | Pro | Tyr | Thr | Ile | Thr | |
| | 1085 | | | | | 1090 | | | | | 1095 | | | | |
| aat | gtg | ttt | tat | gag | cag | tac | ctg | acc | atc | ctc | cct | gag | ggg | ctc | 3339 |
| Asn | Val | Phe | Tyr | Glu | Gln | Tyr | Leu | Thr | Ile | Leu | Pro | Glu | Gly | Leu | |
| | 1100 | | | | | 1105 | | | | | 1110 | | | | |
| ttc | atg | ctc | agc | ctc | tgc | ctt | gtg | ccc | acc | ttc | gct | gtc | tcc | tgc | 3384 |
| Phe | Met | Leu | Ser | Leu | Cys | Leu | Val | Pro | Thr | Phe | Ala | Val | Ser | Cys | |
| | 1115 | | | | | 1120 | | | | | 1125 | | | | |
| ctc | ctg | ctg | ggc | ctg | gac | ctg | cgc | tcc | ggc | ctc | ctc | aac | ctg | ctc | 3429 |
| Leu | Leu | Leu | Gly | Leu | Asp | Leu | Arg | Ser | Gly | Leu | Leu | Asn | Leu | Leu | |
| | 1130 | | | | | 1135 | | | | | 1140 | | | | |
| tcc | att | gtc | atg | atc | ctc | gtg | gac | act | gtc | ggc | ttc | atg | gcc | ctg | 3474 |
| Ser | Ile | Val | Met | Ile | Leu | Val | Asp | Thr | Val | Gly | Phe | Met | Ala | Leu | |
| | 1145 | | | | | 1150 | | | | | 1155 | | | | |
| tgg | gac | atc | agt | tac | aat | gct | gtg | tcc | ctc | atc | aac | ctg | gtc | tcg | 3519 |
| Trp | Asp | Ile | Ser | Tyr | Asn | Ala | Val | Ser | Leu | Ile | Asn | Leu | Val | Ser | |
| | 1160 | | | | | 1165 | | | | | 1170 | | | | |
| gcg | gtg | ggc | atg | tct | gtg | gag | ttt | gtg | tcc | cac | att | acc | cgc | tcc | 3564 |
| Ala | Val | Gly | Met | Ser | Val | Glu | Phe | Val | Ser | His | Ile | Thr | Arg | Ser | |
| | 1175 | | | | | 1180 | | | | | 1185 | | | | |
| ttt | gcc | atc | agc | acc | aag | ccc | acc | tgg | ctg | gag | agg | gcc | aaa | gag | 3609 |
| Phe | Ala | Ile | Ser | Thr | Lys | Pro | Thr | Trp | Leu | Glu | Arg | Ala | Lys | Glu | |
| | 1190 | | | | | 1195 | | | | | 1200 | | | | |
| gcc | acc | atc | tct | atg | gga | agt | gcg | gtg | ttt | gca | ggt | gtg | gcc | atg | 3654 |
| Ala | Thr | Ile | Ser | Met | Gly | Ser | Ala | Val | Phe | Ala | Gly | Val | Ala | Met | |
| | 1205 | | | | | 1210 | | | | | 1215 | | | | |
| acc | aac | ctg | cct | ggc | atc | ctt | gtc | ctg | ggc | ctc | gcc | aag | gcc | cag | 3699 |
| Thr | Asn | Leu | Pro | Gly | Ile | Leu | Val | Leu | Gly | Leu | Ala | Lys | Ala | Gln | |
| | 1220 | | | | | 1225 | | | | | 1230 | | | | |
| ctc | att | cag | atc | ttc | ttc | ttc | cgc | ctc | aac | ctc | ctg | atc | act | ctg | 3744 |
| Leu | Ile | Gln | Ile | Phe | Phe | Phe | Arg | Leu | Asn | Leu | Leu | Ile | Thr | Leu | |
| | 1235 | | | | | 1240 | | | | | 1245 | | | | |
| ctg | ggc | ctg | ctg | cat | ggc | ttg | gtc | ttc | ctg | ccc | gtc | atc | ctc | agc | 3789 |
| Leu | Gly | Leu | Leu | His | Gly | Leu | Val | Phe | Leu | Pro | Val | Ile | Leu | Ser | |
| | 1250 | | | | | 1255 | | | | | 1260 | | | | |

| | |
|---|------|
| tac gtg ggg cct gac gtt aac ccg gct ctg gca ctg gag cag aag | 3834 |
| Tyr Val Gly Pro Asp Val Asn Pro Ala Leu Ala Leu Glu Gln Lys | |
| 1265 1270 1275 | |
| | |
| cgg gct gag gag gcg gtg gca gca gtc atg gtg gcc tct tgc cca | 3879 |
| Arg Ala Glu Glu Ala Val Ala Ala Val Met Val Ala Ser Cys Pro | |
| 1280 1285 1290 | |
| | |
| aat cac ccc tcc cga gtc tcc aca gct gac aac atc tat gtc aac | 3924 |
| Asn His Pro Ser Arg Val Ser Thr Ala Asp Asn Ile Tyr Val Asn | |
| 1295 1300 1305 | |
| | |
| cac agc ttt gaa ggt tct atc aaa ggt gct ggt gcc atc agc aac | 3969 |
| His Ser Phe Glu Gly Ser Ile Lys Gly Ala Gly Ala Ile Ser Asn | |
| 1310 1315 1320 | |
| | |
| ttc ttg ccc aac aat ggg cgg cag ttc tga | 3999 |
| Phe Leu Pro Asn Asn Gly Arg Gln Phe | |
| 1325 1330 | |

<210> 4

<211> 1332

<212> PRT

<213> Homo sapiens

<400> 4

| | |
|---|--|
| Met Ala Glu Ala Gly Leu Arg Gly Trp Leu Leu Trp Ala Leu Leu Leu | |
| 1 5 10 15 | |
| | |
| Arg Leu Ala Gln Ser Glu Pro Tyr Thr Thr Ile His Gln Pro Gly Tyr | |
| 20 25 30 | |
| | |
| Cys Ala Phe Tyr Asp Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Ser | |
| 35 40 45 | |
| | |
| Leu Met Thr Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg | |
| 50 55 60 | |
| | |
| Lys Ile Thr Gly Asp His Leu Ile Leu Leu Gln Lys Ile Cys Pro Arg | |
| 65 70 75 80 | |
| | |
| Leu Tyr Thr Gly Pro Asn Thr Gln Ala Cys Cys Ser Ala Lys Gln Leu | |
| 85 90 95 | |
| | |
| Val Ser Leu Glu Ala Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg | |
| 100 105 110 | |

| | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Cys | Pro | Ala | Cys | Ser | Asp | Asn | Phe | Val | Asn | Leu | His | Cys | His | Asn | Thr | 115 | 120 | 125 | |
| Cys | Ser | Pro | Asn | Gln | Ser | Leu | Phe | Ile | Asn | Val | Thr | Arg | Val | Ala | Gln | 130 | 135 | 140 | |
| Leu | Gly | Ala | Gly | Gln | Leu | Pro | Ala | Val | Val | Ala | Tyr | Glu | Ala | Phe | Tyr | 145 | 150 | 155 | 160 |
| Gln | His | Ser | Phe | Ala | Glu | Gln | Ser | Tyr | Asp | Ser | Cys | Ser | Arg | Val | Arg | 165 | 170 | 175 | |
| Val | Pro | Ala | Ala | Ala | Thr | Leu | Ala | Val | Gly | Thr | Met | Cys | Gly | Val | Tyr | 180 | 185 | 190 | |
| Gly | Ser | Ala | Leu | Cys | Asn | Ala | Gln | Arg | Trp | Leu | Asn | Phe | Gln | Gly | Asp | 195 | 200 | 205 | |
| Thr | Gly | Asn | Gly | Leu | Ala | Pro | Leu | Asp | Ile | Thr | Phe | His | Leu | Leu | Glu | 210 | 215 | 220 | |
| Pro | Gly | Gln | Ala | Val | Gly | Ser | Gly | Ile | Gln | Pro | Leu | Asn | Glu | Gly | Val | 225 | 230 | 235 | 240 |
| Ala | Arg | Cys | Asn | Glu | Ser | Gln | Gly | Asp | Asp | Val | Ala | Thr | Cys | Ser | Cys | 245 | 250 | 255 | |
| Gln | Asp | Cys | Ala | Ala | Ser | Cys | Pro | Ala | Ile | Ala | Arg | Pro | Gln | Ala | Leu | 260 | 265 | 270 | |
| Asp | Ser | Thr | Phe | Tyr | Leu | Gly | Gln | Met | Pro | Gly | Ser | Leu | Val | Leu | Ile | 275 | 280 | 285 | |
| Ile | Ile | Leu | Cys | Ser | Val | Phe | Ala | Val | Val | Thr | Ile | Leu | Leu | Val | Gly | 290 | 295 | 300 | |
| Phe | Arg | Val | Ala | Pro | Ala | Arg | Asp | Lys | Ser | Lys | Met | Val | Asp | Pro | Lys | 305 | 310 | 315 | 320 |
| Lys | Gly | Thr | Ser | Leu | Ser | Asp | Lys | Leu | Ser | Phe | Ser | Thr | His | Thr | Leu | 325 | 330 | 335 | |
| Leu | Gly | Gln | Phe | Phe | Gln | Gly | Trp | Gly | Thr | Trp | Val | Ala | Ser | Trp | Pro | 340 | 345 | 350 | |
| Leu | Thr | Ile | Leu | Val | Leu | Ser | Val | Ile | Pro | Val | Val | Ala | Leu | Ala | Ala | | | | |

| | | | | |
|---|--|-----|--|-----|
| 355 | | 360 | | 365 |
| Gly Leu Val Phe Thr Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser | | | | |
| 370 | | 375 | | 380 |
| Ala Pro Asn Ser Gln Ala Arg Ser Glu Lys Ala Phe His Asp Gln His | | | | |
| 385 | | 390 | | 395 |
| | | | | 400 |
| Phe Gly Pro Phe Phe Arg Thr Asn Gln Val Ile Leu Thr Ala Pro Asn | | | | |
| | | 405 | | 410 |
| | | | | 415 |
| Arg Ser Ser Tyr Arg Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe | | | | |
| | | 420 | | 425 |
| | | | | 430 |
| Ser Gly Ile Leu Asp Leu Asp Leu Leu Leu Glu Leu Leu Glu Leu Gln | | | | |
| | | 435 | | 440 |
| | | | | 445 |
| Glu Arg Leu Arg His Leu Gln Val Trp Ser Pro Glu Ala Gln Arg Asn | | | | |
| | | 450 | | 455 |
| | | | | 460 |
| Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Asp Asn Thr | | | | |
| 465 | | 470 | | 475 |
| | | | | 480 |
| Ser Leu Tyr Asp Cys Cys Ile Asn Ser Leu Leu Gln Tyr Phe Gln Asn | | | | |
| | | 485 | | 490 |
| | | | | 495 |
| Asn Arg Thr Leu Leu Leu Leu Thr Ala Asn Gln Thr Leu Met Gly Gln | | | | |
| | | 500 | | 505 |
| | | | | 510 |
| Thr Ser Gln Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala | | | | |
| | | 515 | | 520 |
| | | | | 525 |
| Pro Leu Thr Phe Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Met Ala | | | | |
| | | 530 | | 535 |
| | | | | 540 |
| Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Ile Gly Gly Tyr Lys | | | | |
| 545 | | 550 | | 555 |
| | | | | 560 |
| Gly Lys Asp Tyr Ser Glu Ala Glu Ala Leu Ile Met Thr Phe Ser Leu | | | | |
| | | 565 | | 570 |
| | | | | 575 |
| Asn Asn Tyr Pro Ala Gly Asp Pro Arg Leu Ala Gln Ala Lys Leu Trp | | | | |
| | | 580 | | 585 |
| | | | | 590 |
| Glu Glu Ala Phe Leu Glu Glu Met Arg Ala Phe Gln Arg Arg Met Ala | | | | |
| | | 595 | | 600 |
| | | | | 605 |

Gly Met Phe Gln Val Thr Phe Thr Ala Glu Arg Ser Leu Glu Asp Glu
610 615 620

Ile Asn Arg Thr Thr Ala Glu Asp Leu Pro Ile Phe Ala Thr Ser Tyr
625 630 635 640

Ile Val Ile Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Ser
645 650 655

Trp Ser Arg Val Met Val Asp Ser Lys Ala Thr Leu Gly Leu Gly Gly
660 665 670

Val Ala Val Val Leu Gly Ala Val Met Ala Ala Met Gly Phe Phe Ser
675 680 685

Tyr Leu Gly Ile Arg Ser Ser Leu Val Ile Leu Gln Val Val Pro Phe
690 695 700

Leu Val Leu Ser Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu
705 710 715 720

Tyr Gln Arg Leu Pro Arg Arg Pro Gly Glu Pro Arg Glu Val His Ile
725 730 735

Gly Arg Ala Leu Gly Arg Val Ala Pro Ser Met Leu Leu Cys Ser Leu
740 745 750

Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Pro Met Pro Ala
755 760 765

Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Val Ile Leu Asp Phe
770 775 780

Leu Leu Gln Met Ser Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys
785 790 795 800

Arg Gln Glu Ala Ser Arg Leu Asp Val Cys Cys Cys Val Lys Pro Gln
805 810 815

Glu Leu Pro Pro Pro Gly Gln Gly Glu Gly Leu Leu Leu Gly Phe Phe
820 825 830

Gln Lys Ala Tyr Ala Pro Phe Leu Leu His Trp Ile Thr Arg Gly Val
835 840 845

Val Leu Leu Leu Phe Leu Ala Leu Phe Gly Val Ser Leu Tyr Ser Met
850 855 860

Cys His Ile Ser Val Gly Leu Asp Gln Glu Leu Ala Leu Pro Lys Asp
865 870 875 880

Ser Tyr Leu Leu Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Phe Glu Val
885 890 895

Gly Ala Pro Val Tyr Phe Val Thr Thr Leu Gly Tyr Asn Phe Ser Ser
900 905 910

Glu Ala Gly Met Asn Ala Ile Cys Ser Ser Ala Gly Cys Asn Asn Phe
915 920 925

Ser Phe Thr Gln Lys Ile Gln Tyr Ala Thr Glu Phe Pro Glu Gln Ser
930 935 940

Tyr Leu Ala Ile Pro Ala Ser Ser Trp Val Asp Asp Phe Ile Asp Trp
945 950 955 960

Leu Thr Pro Ser Ser Cys Cys Arg Leu Tyr Ile Ser Gly Pro Asn Lys
965 970 975

Asp Lys Phe Cys Pro Ser Thr Val Asn Ser Leu Asn Cys Leu Lys Asn
980 985 990

Cys Met Ser Ile Thr Met Gly Ser Val Arg Pro Ser Val Glu Gln Phe
995 1000 1005

His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Arg Pro Asn Ile Lys
1010 1015 1020

Cys Pro Lys Gly Gly Leu Ala Ala Tyr Ser Thr Ser Val Asn Leu
1025 1030 1035

Thr Ser Asp Gly Gln Val Leu Ala Ser Arg Phe Met Ala Tyr His
1040 1045 1050

Lys Pro Leu Lys Asn Ser Gln Asp Tyr Thr Glu Ala Leu Arg Ala
1055 1060 1065

Ala Arg Glu Leu Ala Ala Asn Ile Thr Ala Asp Leu Arg Lys Val
1070 1075 1080

1310
Phe Leu Pro Asn Asn Gly Arg Gln Phe
1325 1330

1320

<210> 5
<211> 885
<212> DNA
<213> Rattus sp.

<400> 5
ccacgcgtcc gcacctgcaa gtgtgggtccc ctgaggcaga gcgcaacatc tccctccagg 60
acatctgcta tgccccctc aacccatata acaccagcct ctccgactgc tgtgtcaaca 120
gcctccttca gtacttccag aacaaccgca ccctcctgat gctcacggcc aaccagactc 180
tgaatggcca gacctccctg gtggactgga aggaccattt cctctactgt gcaaattgcc 240
ctctcacgtt caaagatggc acgtctctgg ccctgagctg catggctgac tacggggctc 300
ctgtcttccc ctctcttgct gttgggggat accaaggcac ggactattcc gaggcagaag 360
cgctgatcat aaccttctct ctcaataact accccgctga tgatccccgc atggcccagg 420
ccaagctctg ggaggaggct ttcttgaagg aatggaatc cttccagagg aacacaagtg 480
acaagttcca ggttgcgttc tcagctgagc gctctctgga ggatgagatc aaccgcacca 540
ccatccagga cctgcctgtc tttgccgtca gctacattat cgtcttctctg tacatctccc 600
tgGCCctggg cagctactcc agatgcagcc gagtagcggg ggagtccaag gctactctgg 660
gcctaggtgg ggtgatagtg tgctgggagc agttctggct tgcattggggc ttctaactcc 720
tacctgggtg tccccctctc tctgggtatc atccaagtgg tacctttcct ggtgcttaag 780
ctgtgggagc tggacacatc tacatcctag acttgagtac cagaggtacc taggaagccg 840
cggaacagcg aaaaggacac attggggcgca ccctgggcat gtggc 885

<210> 6
<211> 458
<212> DNA
<213> Rattus sp.

<400> 6
gaccagatgt taaccaagct ctggtacagg aggagaaact agccagcgag gcagcagtgg 60

| | |
|--|-----|
| ccccagagcc ttcttgccca cagtaccctt ccctgctga tgcggatgcc aatgttaact | 120 |
| acggctttgc ccagaactt gccacggag ctaatgctgc tagaagctct ttgccccaaa | 180 |
| gtgacccaaa gttctaattg agtaggagct tgtccatgct tctgctgatg agggatcatg | 240 |
| aaggcttcc ctctgggtgt cctcaaggcc tggggggagg ttgttcagag aaaaatggct | 300 |
| ggcattcctg ccacgaggca accggcagct tggcactgac tccttggtct catagggtccc | 360 |
| taaggcttgg tcagattact cctcatggag agactatctt aagtatctaa gctatcgatt | 420 |
| gggatgcac gctgttcatt aaaaaggcta tggctatg | 458 |

<210> 7

<211> 896

<212> DNA

<213> Rattus sp.

<400> 7

| | |
|--|-----|
| ccacgcgtcc gcagtttcat aagtacctgc cctggttcct gaatgatccg cccaatatca | 60 |
| gatgtcccaa aggggggtcta gcagcgtata gaacgtctgt gaatttgagc tcagatggcc | 120 |
| aggttatagc ctcccagttc atggcctacc acaagccctt aaggaactca caggacttca | 180 |
| cagaagctct ccgggcgtcc cggttgctag cagccaacat cacagctgac ctacggaagg | 240 |
| tgcctgggac agatccaaac tttgaggtct tcccttacac gatctccaac gtgttctacc | 300 |
| agcaatacct gacggtcctt cctgagggaa tcttcaccct tgctctttgc tttgtgcca | 360 |
| cctttgttgt ctgctacctc ctactgggcc tggacatgtg ctcagggatc ctcaacctac | 420 |
| tctccatcat tatgattctc gtggacacca ttggcctcat ggctgtgtgg ggtatcagct | 480 |
| ataatgcggt atccctcatc aaccttgtca cggcagtggg catgtctgtg gagtttgtgt | 540 |
| cccacatcac tcggtccttt gcttgtaagc accaagccta cccggctgga gagggctaaa | 600 |
| agatgctact gtcttcatgg gcagtgcggt gtttgctgga gtggccatga ccaacttccc | 660 |
| aggcatcctc atcttggggg ctttgcccca agcccaggct tattcagatc ttcttcttcc | 720 |
| gcctcaacct tctgatcacc tttgctgggg tctgctgcat ggctgggtctt cctgcccggg | 780 |
| ttgtcctcag ctatctggga ccagatgtaa ccaaggctct gctaccgga ggagaaacta | 840 |
| gccagcgagg gcagcagtgg cccagagac ttcttgccca caagtacct tccttg | 896 |

<210> 8

<211> 3124

<212> DNA

<213> Rattus sp.

<400> 8

| | |
|---|------|
| tgcaagtgtg gtccccctgag gcagagcgca acatctccct ccaggacatc tgctatgccc | 60 |
| ccctcaaccc atataacacc agcctctccg actgctgtgt caacagcctc cttcagtact | 120 |
| tccagaacaa ccgcaccctc ctgatgctca cggccaacca gactctgaat ggccagacct | 180 |
| ccctgggtgga ctggaaggac catttcctct actgtgcaaa tgccccctctc acgttcaaag | 240 |
| atggcacgtc tctggccctg agctgcatgg ctgactacgg ggctcctgtc ttccccctcc | 300 |
| ttgctgttgg gggataccaa ggcacggact attccgaggg agaagcgctg atcataacct | 360 |
| tctctctcaa taactacccc gctgatgatc cccgcatggc ccaggccaag ctctgggagg | 420 |
| aggctttctt gaaggaaatg gaatccttcc agaggaacac aagtgacaag ttccagggtg | 480 |
| cgttctcagc tgagcgctct ctggaggatg agatcaaccg caccaccatc caggacctgc | 540 |
| ctgtctttgc cgtcagctac attatcgtct tcctgtacat ctccctggcc ctgggcagct | 600 |
| actccagatg cagccgagta gcggtggagt ccaaggctac tctgggccta ggtgggggtga | 660 |
| ttgttgtgct gggagcagtt ctggctgcca tgggcttcta ctccctacctg ggtgtccct | 720 |
| cttctctggt tatcatccaa gtggtacctt tcctggtgct agctgtggga gctgacaaca | 780 |
| tcttcatctt tgttcttgag taccagaggc tacctaggat gcctggggaa cagcgagagg | 840 |
| ctcacattgg ccgcaccctg ggcagtgtgg cccccagcat gctgctgtgc agcctctctg | 900 |
| aggccatctg cttcttttcta ggggccctga ccccatgcc agctgtgagg accttcgcct | 960 |
| tgacctctgg cttagcaatt atcctcgact tcctgctcca gatgactgcc tttgtggccc | 1020 |
| tgctctccct ggatagcaag aggcaggagg cctctcgccc ggatgtctta tgctgctttt | 1080 |
| caaccgggaa gctgccccca cctaaagaaa aagaaggcct cttactccgc ttcttccgca | 1140 |
| agatatacgc tccttttctg ctgcacagat tcatccgccc tgttgtgatg ctgctgtttc | 1200 |
| tgacctgtt tggagcaaat ctctacttaa tgtgcaacat caacgtgggg ctagaccagg | 1260 |
| agctggctct gcccaaggac tcgtacttga tagactactt cctctttctg aaccgatacc | 1320 |
| ttgaagtggg gcctccagtg tactttgtca ccacctcggg cttcaacttc tccagcgagg | 1380 |
| caggcatgaa cgccacttgc tctagcgcag gctgtaagag cttctcccta acccagaaaa | 1440 |
| tccagtatgc cagtgaattc cctgaccagt cttacgtggc tattgctgca tcctcctggg | 1500 |
| tagatgactt catcgactgg ctgaccccgct cctcctcctg ctgtcgccct tatatacgtg | 1560 |

| | |
|---|------|
| gccccataa ggatgagttc tgtccctcaa cggatacttc cttcaactgc ttaaaaaact | 1620 |
| gcatgaaccg cactctgggt cctgtgaggg ccacagcgga acagtttcat aagtacctgc | 1680 |
| cctggttcct gaatgatccg cccaatatca gatgtcccaa aggggggtcta gcagcgtata | 1740 |
| gaacgtctgt gaatttgagc tcagatggcc aggttatagc ctcccagttc atggcctacc | 1800 |
| acaagccctt aaggaactca caggacttca cagaagctct ccgggcgctc cggttgctag | 1860 |
| cagccaacat cacagctgac ctacggaagg tgcctgggac agatccaaac tttgaggtct | 1920 |
| tcccttacac gatctccaac gtgttctacc agcaatacct gacggtcctt cctgagggaa | 1980 |
| tcttcaccct tgctctttgc tttgtgcca cctttgttgt ctgctacctc ctactggggc | 2040 |
| tggacatgtg ctcagggatc ctcaacctac tctccatcat tatgattctc gtggacacca | 2100 |
| ttggcctcat ggctgtgtgg ggtatcagct ataatgcggt atccctcatc aaccttgtca | 2160 |
| cggcagtggg catgtctgtg gagtttgtgt cccacatcac tcggtccttt gctgtaagca | 2220 |
| ccaagcctac ccggctggag agggctaaag atgctactgt cttcatgggc agtgcggtgt | 2280 |
| ttgctggagt ggccatgacc aacttcccag gcattcctcat cttgggcttt gcccaagccc | 2340 |
| agcttattca gatcttcttc ttccgcctca accttctgat caccttgctg ggtctgctgc | 2400 |
| atggcctggg cttcctgccg gttgtcctca gctatctggg accagatgtt aaccaagctc | 2460 |
| tggtagagga ggagaaacta gccagcgagg cagcagtggc ccagagacct tcttgcccac | 2520 |
| agtaccctc ccctgctgat gcggatgcca atgttaacta cggctttgcc ccagaacttg | 2580 |
| cccacggagc taatgctgct agaagctctt tgcccaaaag tgaccaaaag ttctaattga | 2640 |
| gtaggagctt gtccatgctt cttgctgatg agggatcatg aaggctcttc ctctggttgt | 2700 |
| cctcaaggcc tggggggagg ttgtttcaga gaaaaatggc tggcattcct gccacgaggc | 2760 |
| aaccggcagc attggcactg acctccttgc tctcataggt ccctaaggcc ttggtcagat | 2820 |
| tacctcctcc atggagagac tatcttaagt atcttaagta tcgtatggga tgcacgcct | 2880 |
| gtcaattaaa aaggctatgg cctatggctc aggcagggcc atccggaaga agagaggatt | 2940 |
| ctgggataaa gccagggtggg agattcgcct ggggaaaatg tgacaatggg tcctgagcat | 3000 |
| gggcaatcag ccatgtggca gaatgtaaataa taatataaat gggttgtctt aagttatgat | 3060 |
| tctagctggg gaggagccta gctgtgtagc caagatattt gtaaataataa aaaaaaaaaa | 3120 |
| aaaa | 3124 |

<210> 9

<211> 4484

<212> DNA

<213> Rattus sp.

<400> 9

| | |
|--|------|
| atggcagctg cctggctggg atggctgctc tgggccctgc tcctgagcgc ggcccagggt | 60 |
| gagctataca cacccaaaca cgaagctggg gtctgcacct ttacgaaga gtgcgggaaa | 120 |
| aaccagagc tctctggagg cctcacgtca ctatccaatg tctcctgcct gtctaacc | 180 |
| ccggcccgcc acgtcacggg tgaacacctg gctcttctcc agcgcctctg tccccgcctg | 240 |
| tacaacggcc ccaataccac ttttgctgtg tgctctacca agcagctgct gtccttagaa | 300 |
| agcagcatgt ccatcaccaa ggcccttctc acgcgctgcc cggcctgctc tgacaatttt | 360 |
| gtgagcttac actgccacaa cacttgcagc cctgaccaga gcctcttcat caacgtcacc | 420 |
| cgggtggttg agcggggcgc tggagagcct cctgccgtgg tggcctatga ggccctttat | 480 |
| cagcgcagct ttgctgagaa ggccctatgag tcctgcagcc aggtgcgcat ccctgcggcc | 540 |
| gcttccttgg ccgtgggcag catgtgtgga gtgtatggct ccgccctctg caatgctcag | 600 |
| cgttggtca acttccaagg agacacaggg aatggcctgg ctccgctgga tatcaccttc | 660 |
| cacctcttgg agcctggcca ggccctaccg gatgggatcc agccactgaa tgggaagatc | 720 |
| gcaccctgca acgagtctca gggatgatgac tcagcagtct gctcctgcca ggactgtgcg | 780 |
| gcgtcctgcc ctgtcatccc tccgcccagag gccttgcgcc cttccttcta catgggtcgc | 840 |
| atgccaggct ggctggccct catcatcatc ttcactgctg tctttgtgtt gctctctgca | 900 |
| gtccttgtgc gtctccgagt ggtttccaac aggaacaaga acaaggcaga agggccccag | 960 |
| gaagccccca aactccctca taagcacaaa ctctcacccc ataccatcct gggccgggttc | 1020 |
| ttccagaact ggggcacaag ggtggcctcg tggccactca ccgtcttagc actgtccttc | 1080 |
| atcgttgtga tagccttagc agcaggcctg acctttattg aactcaccac agaccctgtg | 1140 |
| gaactgtggt cggcccccaa gagccaggcc cggaaagaga agtctttcca tgatgagcat | 1200 |
| ttcggccctt tctttcgaac caaccagatt ttcgtgacag ctcggaacag gtccagctac | 1260 |
| aagtacgact ccctactgct aggggtccaag aacttcagtg ggatcctgtc cctggacttc | 1320 |
| ctgctggagc tgctggagct tcaggagagg cttcgacacc tgcaagtgtg gtccctgag | 1380 |
| gcagagcgca acatctccct ccaggacatc tgctatgccc ccctcaaccc atataacacc | 1440 |
| agcctctccg actgctgtgt caacagcctc cttcagtact tccagaacaa ccgcaccctc | 1500 |
| ctgatgctca cggccaacca gactctgaat ggccagacct ccctgggtgga ctggaaggac | 1560 |
| catttcctct actgtgcaaa tgccctctc acgttcaaag atggcacgtc tctggccctg | 1620 |
| agctgcatgg ctgactacgg ggctcctgtc ttcccttcc ttgctgttgg gggataccaa | 1680 |

| | |
|--|------|
| ggcacggact attccgaggc agaagcgctg atcataacct tctctctcaa taactacccc | 1740 |
| gctgatgata cccgcatggc ccaggccaag ctctgggagg aggctttctt gaaggaaatg | 1800 |
| gaatccttcc agaggaacac aagtgacaag ttccagggtg cgttctcagc tgagcgctct | 1860 |
| ctggaggatg agatcaaccg caccaccatc caggacctgc ctgtctttgc cgtcagctac | 1920 |
| attatcgtct tcctgtacat ctccctggcc ctgggcagct actccagatg cagccgagta | 1980 |
| gcggtggagt ccaaggctac tctgggccta ggtgggggtga ttgttggtgt gggagcagtt | 2040 |
| ctggctgcca tgggcttcta ctctacctg ggtgtccct cttctctggt tatcatccaa | 2100 |
| gtggtacctt tcctgggtgt agctgtggga gctgacaaca tcttcatctt tgttcttgag | 2160 |
| taccagaggc tacctaggat gcctggggaa cagcgagagg ctacattgg ccgcaccctg | 2220 |
| ggcagtgtgg cccccagcat gctgctgtgc agcctctctg aggccatctg cttctttcta | 2280 |
| ggggccctga ccccatgcc agctgtgagg accttcgcct tgacctctgg cttagcaatt | 2340 |
| atcctcgact tcctgctcca gatgactgcc tttgtggccc tgctctccct ggatagcaag | 2400 |
| aggcaggagg cctctcgccc ggatgtctta tgctgctttt caaccggaa gctgccccca | 2460 |
| cctaaagaaa aagaaggcct cttactccgc ttcttccgca agatatacgc tcctttcctg | 2520 |
| ctgcacagat tcatccgccc tgttgtgatg ctgctgtttc tgacctgtt tggagcaaat | 2580 |
| ctctacttaa tgtgcaacat caacgtgggg ctagaccagg agctggctct gcccaaggac | 2640 |
| tcgtacttga tagactactt cctctttctg aaccgatacc ttgaagtgg gcctccagt | 2700 |
| tactttgtca ccacctcggg cttcaacttc tccagcgagg caggcatgaa cgccacttgc | 2760 |
| tctagcgcag gctgtaagag cttctcccta acccagaaaa tccagtatgc cagtgaattc | 2820 |
| cctgaccagt cttacgtggc tattgctgca tcctcctggg tagatgactt catcgactgg | 2880 |
| ctgaccccg t cctcctcctg ctgtcgctt tatatacgtg gcccccataa ggatgagttc | 2940 |
| tgctcctcaa cggatacttc cttcaactgc ttaaaaaact gcatgaaccg cactctgggt | 3000 |
| cctgtgaggc ccacagcgga acagtttcat aagtacctgc cctgggttctt gaatgatccg | 3060 |
| cccaatatca gatgtcccaa aggggggtcta gcagcgtata gaacgtctgt gaatttgagc | 3120 |
| tcagatggcc aggttatagc ctcccagttc atggcctacc acaagccctt aaggaactca | 3180 |
| caggacttca cagaagctct ccgggcgtcc cggttgctag cagccaacat cacagctgac | 3240 |
| ctacggaagg tgcttgggac agatccaaac tttgaggtct tcccttacac gatctccaac | 3300 |
| gtgttctacc agcaatacct gacggctcct cctgagggaa tcttcaccct tgctctttgc | 3360 |
| tttgtgcca cctttgttgt ctgctacctc ctactgggccc tggacatgtg ctcagggatc | 3420 |
| ctcaacctac tctccatcat tatgattctc gtggacacca ttggcctcat ggctgtgtgg | 3480 |
| ggtatcagct ataatgcggt atccctcatc aaccttgtca cggcagtggg catgtctgtg | 3540 |

| | |
|---|------|
| gagtttgtgt cccacatcac tcggtccttt gctgtaagca ccaagcctac ccggctggag | 3600 |
| agggctaaag atgctactgt cttcatgggc agtgcggtgt ttgctggagt ggccatgacc | 3660 |
| aacttcccag gcatcctcat cttggggcttt gcccaagccc agcttattca gatcttcttc | 3720 |
| ttccgcctca accttctgat caccttgctg ggtctgctgc atggcctggg cttcctgccg | 3780 |
| gttgctcctca gctatctggg accagatggt aaccaagctc tggtaacagga ggagaaacta | 3840 |
| gccagcgagg cagcagtggc ccagagacct tcttgcccac agtaccctc ccctgctgat | 3900 |
| gcggatgcca atgttaacta cggctttgcc ccagaacttg ccacggagc taatgctgct | 3960 |
| agaagctctt tgcccaaaag tgaccaaaag ttctaattga gtaggagctt gtccatgctt | 4020 |
| cttgctgatg agggatcatg aaggctcttc ctctgggtgt cctcaaggcc tggggggagg | 4080 |
| ttgtttcaga gaaaaatggc tggcattcct gccacgaggc aaccggcagc attggcactg | 4140 |
| acctccttgc tctcataggt ccctaaggcc ttggtcagat tacctcctcc atggagagac | 4200 |
| tatcttaagt atcttaagta tcgtatggga tgcctgcct gtcaattaaa aaggctatgg | 4260 |
| cctatggctc aggcagggcc atccggaaga agagaggatt ctgggataaa gccaggtggg | 4320 |
| agattcgcct ggggaaaatg tgacaatggg tcttgagcat gggcaatcag ccatgtggca | 4380 |
| gaatgtaaataa taatataaat gggttgtctt aagttatgat tctagctggg gaggagccta | 4440 |
| gctgtgtagc caagatattt gtaaataataa aaaaaaaaaa aaaa | 4484 |

<210> 10

<211> 3993

<212> DNA

<213> Rattus sp.

<400> 10

| | |
|---|-----|
| atggcngcng cntggytnng ntggytnytn tgggcnynny tnytnwsngc ngcncarggn | 60 |
| garytnntaya cncnaarca ygargcnggn gtntgyacnt tytaygarga rtgyggnaar | 120 |
| aayccngary tnwsngngng nytnacnwsn ytnwsnaayg tnwsntgyyt nwsnaayacn | 180 |
| ccngcnmgnc aygtnacngg ngarcayytn gcnytnytn armgnathtg yccnmgnytn | 240 |
| tayaayggnc cnaayacnac nttygcntgy tgywsnacna arcarytnyt nwsnytnGAR | 300 |
| wsnwsnatgw snathacnaa rgcnynytn acnmngntgyc cngcntgyws ngayaaytty | 360 |
| gtnwsnytn aytgycaay yacntgywsn ccngaycarw snytnnttyat haaygtnacn | 420 |
| mgngtngtng armngngngc ngngnarcen ccngcngtng tngcntayga rgcnttytay | 480 |

| | | | | | | |
|------------|------------|------------|-------------|------------|-------------|------|
| carmgnwsnt | tygcngaraa | rgcntaygar | wsntgywsnc | argtnmgnat | hccngcngcn | 540 |
| gcnwsnytn | cngtnggnws | natgtgyggn | gtntaygggnw | sngcnytn | yaaygcncar | 600 |
| mgntggytna | ayttycargg | ngayacnggn | aayggnytn | cncnytn | yathacntty | 660 |
| cayytnytn | arccnggnca | rgcnytnccn | gayggcnathc | arccnytnaa | yggnaarath | 720 |
| gcncntgya | aygarwsnca | rggngaygay | wsngcngtnt | gywsntgyca | rgaytgygcn | 780 |
| gcnwsntgyc | cngtnathcc | nccncngar | gcnytnmgnc | cnwsnttyta | yatgggnmgn | 840 |
| atgccnggnt | ggytngcnyt | nathathath | ttyacngcng | tnttygtnyt | nytnwsngcn | 900 |
| gtnytngtm | gnytnmgnt | ngtnwsnaay | mgnaayaara | ayaargcnga | rggnccncar | 960 |
| gargcncna | arytnccnca | yaarcayaar | ytnwsnccnc | ayacnathyt | nggnmgntty | 1020 |
| ttycaraayt | gggnacnmg | ngtngcnwsn | tgccnytna | cngtnytn | nytnwsntty | 1080 |
| athgtngtna | thgcnytn | ngcnggnytn | acnttyathg | arytnacnac | ngayccngtn | 1140 |
| garytn | sgcncncnaa | rwsncargcn | mgnaargara | arwsnttyca | ygaygarca | 1200 |
| ttyggncnt | tyttymgnac | naaycarath | ttygtnacng | cnmgnaaymg | nwsnwsntay | 1260 |
| aartaygayw | snytnytnyt | nggnwsnaar | aayttywsng | gnathytnws | nytngaytty | 1320 |
| ytnytngary | tnytngaryt | ncargarmgn | ytnmgncayy | tncargtntg | gwsnccngar | 1380 |
| gcngarmgna | ayathwsnyt | ncargayath | tgytaygcnc | cnytnaaycc | ntayaayaacn | 1440 |
| wsnytnwsng | aytgytgygt | naaywsnytn | ytncartayt | tycaraayaa | ymgnacnytn | 1500 |
| ytnatgytna | cngcnaayca | racnytnaay | ggncaracnw | snytngtnga | ytggaargay | 1560 |
| cayttyytnt | aytgygcnaa | ygcncnytn | acnttyaarg | ayggnacnws | nytngcnytn | 1620 |
| wsntgyatgg | cngaytaygg | ngcncngtn | ttyccnttyy | tngcngtngg | nggntaycar | 1680 |
| ggnacngayt | aywsngargc | ngargcnytn | athathacnt | tywsnytnaa | yaaytayccn | 1740 |
| gcngaygayc | cnmgnatggc | ncargcnaar | ytntgggarg | argcnttyyt | naargaratg | 1800 |
| garwsnttyc | armgnaayac | nwsngayaar | ttycargtng | cnttywsngc | ngarmgnwsn | 1860 |
| ytnargayg | arathaaymg | nacnacnath | cargayytn | cngtnttygc | ngtnwsntay | 1920 |
| athathgtnt | tyytntayat | hwsnytn | ytngggnwsnt | aywsnmgntg | ywsnmgngtn | 1980 |
| gcngtngarw | snaargcnac | nytnggnytn | ggnggngtna | thgtngtnyt | nggngcngtn | 2040 |
| ytngcngcna | tgggnttyta | ywsntayytn | ggngtnccnw | snwsnytn | nathathcar | 2100 |
| gtngtnccnt | tyytngtnyt | ngcngtnggn | gcngayaaya | thttyathtt | ygtnytn | 2160 |
| taycarmgny | tnccnmgnat | gccngngar | carmgngarg | cncayathgg | nmgnacnytn | 2220 |
| ggnwsngtng | cncnwsnat | gytnytn | wsnytnwsng | argcnathtg | ytytytytn | 2280 |

| | |
|---|------|
| ggngcnynatna cncnatgcc ngcngtnmgn acnttygcny tnacnwsngg nytngcnath | 2340 |
| athytngayt tyytnytnca ratgacngcn ttygtngcny tnytnwsnyt ngaywsnaar | 2400 |
| mgncargarg cnwsnmgncc ngaygtnytn tgytgyttyw snacnmgnaa rytncncncn | 2460 |
| ccnaargara argarggnyt nytnytnmgn ttyttymgna arathtaygc nccnttyytn | 2520 |
| ytncaymgnt tyathmgnc ngtnngtnatg ytnytnnttyy tnacnytnntt yggngcnaay | 2580 |
| ytnatayytna tgtgyaayat haaygtnggn ytngaycarg arytnngcnyt nccnaargay | 2640 |
| wsntayytna thgaytaytt yytnnttyytn aaymgntayy tngargtngg nccncngtn | 2700 |
| tayttygtna cnacnwsngg nttyaaytty wsnwsngarg cnggnatgaa ygcnaentgy | 2760 |
| wsnwsngcng gntgyaarws nttywsnytn acncaraara thcartaygc nwsngartty | 2820 |
| ccngaycarw sntaygtngc nathgcngcn wsnwsntggg tngaygaytt yathgaytgg | 2880 |
| ytnacncnw snwsnwsntg ytgymgnytn tayathmgng gncncayaa rgaygartty | 2940 |
| tgyccnwsna cngayacnws nttyaaytgy ytnaaraayt gyatgaaymg nacnytnngn | 3000 |
| ccngtnmgnc cnacngcnga rcarttycay aartayytnc cntgggttyt naaygayccn | 3060 |
| ccnaayathm gntgyccnaa rggnggnytn gcngcntaym gnacnwsngt naayytnwsn | 3120 |
| wsngayggnc argtnathgc nwsncartty atggcntayc ayaarccnyt nmgnaaywsn | 3180 |
| cargayttya cngargcnyt nmngncnwsn mgnytnytng cngcnaayat hacngcngay | 3240 |
| ytnmgnaarg tnccnggnac ngayccnaay ttygargtnt tyccntayac nathwsnaay | 3300 |
| gtnttytayc arcartayyt nacngtnytn ccngarggna thttyacnyt ngcnytnntgy | 3360 |
| ttygtncna cnttygtngt ntgytayytn ytnytnngny tngayatgtg ywsnggnath | 3420 |
| ytnaayytny tnwsnathat hatgathytn gtngayacna thggnytnat ggcngtntgg | 3480 |
| ggathwsnt ayaaygcngt nwsnytnath aayytngtna cngcngtngg natgwsngtn | 3540 |
| garttygtnw sncayathac nmgnwsntty gcngtnwsna cnaarccnac nmgnytngar | 3600 |
| mgngcnaarg aygcnaacngt nttyatgggn wsngcngtnt tygcnggngt ngcnatgacn | 3660 |
| aayttyccng gnathytnat hytnngntty gcncargcnc arytnathca rathttytty | 3720 |
| ttymgnytna ayytnytnat hacnytnytn ggnytnytn cngnytnngt nttyytnccn | 3780 |
| gtngtnytnw sntayytngg nccngaygt n aaycargcny tngtncarga rgaraarytn | 3840 |
| gcnwsngarg cngcngtngc nccngarccn wsntgyccnc artayccnws nccngcngay | 3900 |
| gcngaygcna aygtnaayta yggnttygc cngarytng cncayggngc naaygcngcn | 3960 |
| mgnwsnwsny tnccnaarws ngaycaraar tty | 3993 |

<211> 4002

<212> DNA

<213> Mus sp.

<220>

<221> CDS

<222> (1)..(4002)

<223>

<400> 11

| | |
|---|----|
| atg gca gct gcc tgg cag gga tgg ctg ctc tgg gcc ctg ctc ctg aat | 48 |
| Met Ala Ala Ala Trp Gln Gly Trp Leu Leu Trp Ala Leu Leu Leu Asn | |
| 1 5 10 15 | |

| | |
|---|----|
| tcg gcc cag ggt gag ctc tac aca ccc act cac aaa gct ggc ttc tgc | 96 |
| Ser Ala Gln Gly Glu Leu Tyr Thr Pro Thr His Lys Ala Gly Phe Cys | |
| 20 25 30 | |

| | |
|---|-----|
| acc ttt tat gaa gag tgt ggg aag aac cca gag ctt tct gga ggc ctc | 144 |
| Thr Phe Tyr Glu Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Gly Leu | |
| 35 40 45 | |

| | |
|---|-----|
| aca tca cta tcc aat atc tcc tgc ttg tct aat acc cca gcc cgc cat | 192 |
| Thr Ser Leu Ser Asn Ile Ser Cys Leu Ser Asn Thr Pro Ala Arg His | |
| 50 55 60 | |

| | |
|---|-----|
| gtc aca ggt gac cac ctg gct ctt ctc cag cgc gtc tgt ccc cgc cta | 240 |
| Val Thr Gly Asp His Leu Ala Leu Leu Gln Arg Val Cys Pro Arg Leu | |
| 65 70 75 80 | |

| | |
|---|-----|
| tac aat ggc ccc aat gac acc tat gcc tgt tgc tct acc aag cag ctg | 288 |
| Tyr Asn Gly Pro Asn Asp Thr Tyr Ala Cys Cys Ser Thr Lys Gln Leu | |
| 85 90 95 | |

| | |
|---|-----|
| gtg tca tta gac agt agc ctg tct atc acc aag gcc ctc ctt aca cgc | 336 |
| Val Ser Leu Asp Ser Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg | |
| 100 105 110 | |

| | |
|---|-----|
| tgc ccg gca tgc tct gaa aat ttt gtg agc ata cac tgt cat aat acc | 384 |
| Cys Pro Ala Cys Ser Glu Asn Phe Val Ser Ile His Cys His Asn Thr | |
| 115 120 125 | |

| | |
|---|-----|
| tgc agc cct gac cag agc ctc ttc atc aat gtt act cgc gtg gtt cag | 432 |
| Cys Ser Pro Asp Gln Ser Leu Phe Ile Asn Val Thr Arg Val Val Gln | |
| 130 135 140 | |

| | |
|---|-----|
| cgg gac cct gga cag ctt cct gct gtg gtg gcc tat gag gcc ttt tat | 480 |
| Arg Asp Pro Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr | |
| 145 150 155 160 | |

| | |
|---|-----|
| caa cgc agt ttt gca gag aag gcc tat gag tcc tgt agc cgg gtg cgc | 528 |
| Gln Arg Ser Phe Ala Glu Lys Ala Tyr Glu Ser Cys Ser Arg Val Arg | |

| 165 | | | | | 170 | | | | | 175 | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| atc | cct | gca | gct | gcc | tcg | ctg | gct | gtg | ggc | agc | atg | tgt | gga | gtg | tat | 576 |
| Ile | Pro | Ala | Ala | Ala | Ser | Leu | Ala | Val | Gly | Ser | Met | Cys | Gly | Val | Tyr | |
| | | | 180 | | | | | 185 | | | | | 190 | | | |
| ggc | tct | gcc | ctc | tgc | aat | gct | cag | cgc | tgg | ctc | aac | ttc | caa | gga | gac | 624 |
| Gly | Ser | Ala | Leu | Cys | Asn | Ala | Gln | Arg | Trp | Leu | Asn | Phe | Gln | Gly | Asp | |
| | | | 195 | | | | | 200 | | | | | 205 | | | |
| aca | ggg | aat | ggc | ctg | gct | ccg | ctg | gac | atc | acc | ttc | cac | ctc | ttg | gag | 672 |
| Thr | Gly | Asn | Gly | Leu | Ala | Pro | Leu | Asp | Ile | Thr | Phe | His | Leu | Leu | Glu | |
| | | | 210 | | | | | 215 | | | | | 220 | | | |
| cct | ggc | cag | gcc | ctg | gca | gat | ggg | atg | aag | cca | ctg | gat | ggg | aag | atc | 720 |
| Pro | Gly | Gln | Ala | Leu | Ala | Asp | Gly | Met | Lys | Pro | Leu | Asp | Gly | Lys | Ile | |
| 225 | | | | | | 230 | | | | | 235 | | 240 | | | |
| aca | ccc | tgc | aat | gag | tcc | cag | ggt | gaa | gac | tcg | gca | gcc | tgt | tcc | tgc | 768 |
| Thr | Pro | Cys | Asn | Glu | Ser | Gln | Gly | Glu | Asp | Ser | Ala | Ala | Cys | Ser | Cys | |
| | | | 245 | | | | | 250 | | | | | 255 | | | |
| cag | gac | tgt | gca | gca | tcc | tgc | cct | gtc | atc | cct | ccg | ccc | ccg | gcc | ctg | 816 |
| Gln | Asp | Cys | Ala | Ala | Ser | Cys | Pro | Val | Ile | Pro | Pro | Pro | Pro | Ala | Leu | |
| | | | 260 | | | | | 265 | | | | | 270 | | | |
| cgc | cct | tct | ttc | tac | atg | ggt | cga | atg | cca | ggc | tgg | ctg | gct | ctc | atc | 864 |
| Arg | Pro | Ser | Phe | Tyr | Met | Gly | Arg | Met | Pro | Gly | Trp | Leu | Ala | Leu | Ile | |
| | | | 275 | | | | | 280 | | | | | 285 | | | |
| atc | atc | ttc | act | gct | gtc | ttt | gta | ttg | ctc | tct | gtt | gtc | ctt | gtg | tat | 912 |
| Ile | Ile | Phe | Thr | Ala | Val | Phe | Val | Leu | Leu | Ser | Val | Val | Leu | Val | Tyr | |
| | | | 290 | | | | | 295 | | | | | 300 | | | |
| ctc | cga | gtg | gct | tcc | aac | agg | aac | aag | aac | aag | aca | gca | ggc | tcc | cag | 960 |
| Leu | Arg | Val | Ala | Ser | Asn | Arg | Asn | Lys | Asn | Lys | Thr | Ala | Gly | Ser | Gln | |
| 305 | | | | | | 310 | | | | | 315 | | 320 | | | |
| gaa | gcc | ccc | aac | ctc | cct | cgt | aag | cgc | aga | ttc | tca | cct | cac | act | gtc | 1008 |
| Glu | Ala | Pro | Asn | Leu | Pro | Arg | Lys | Arg | Arg | Phe | Ser | Pro | His | Thr | Val | |
| | | | 325 | | | | | 330 | | | | | 335 | | | |
| ctt | ggc | cgg | ttc | ttc | gag | agc | tgg | gga | aca | agg | gtg | gcc | tca | tgg | cca | 1056 |
| Leu | Gly | Arg | Phe | Phe | Glu | Ser | Trp | Gly | Thr | Arg | Val | Ala | Ser | Trp | Pro | |
| | | | 340 | | | | | 345 | | | | | 350 | | | |
| ctc | act | gtc | ttg | gca | ctg | tcc | ttc | ata | gtt | gtg | ata | gcc | ttg | tca | gta | 1104 |
| Leu | Thr | Val | Leu | Ala | Leu | Ser | Phe | Ile | Val | Val | Ile | Ala | Leu | Ser | Val | |
| | | | 355 | | | | | 360 | | | | | 365 | | | |
| ggc | ctg | acc | ttt | ata | gaa | ctc | acc | aca | gac | cct | gtg | gaa | ctg | tgg | tcg | 1152 |
| Gly | Leu | Thr | Phe | Ile | Glu | Leu | Thr | Thr | Asp | Pro | Val | Glu | Leu | Trp | Ser | |
| | | | 370 | | | | | 375 | | | | | 380 | | | |
| gcc | cct | aaa | agc | caa | gcc | cgg | aaa | gaa | aag | gct | ttc | cat | gac | gag | cat | 1200 |
| Ala | Pro | Lys | Ser | Gln | Ala | Arg | Lys | Glu | Lys | Ala | Phe | His | Asp | Glu | His | |
| 385 | | | | | | 390 | | | | | 395 | | 400 | | | |
| ttt | ggc | ccc | ttc | ttc | cga | acc | aac | cag | att | ttt | gtg | aca | gct | aag | aac | 1248 |
| Phe | Gly | Pro | Phe | Phe | Arg | Thr | Asn | Gln | Ile | Phe | Val | Thr | Ala | Lys | Asn | |
| | | | 405 | | | | | 410 | | | | | 415 | | | |

| | |
|---|------|
| agg tcc agc tac aag tac gac tcc ctg ctg cta ggg ccc aag aac ttc | 1296 |
| Arg Ser Ser Tyr Lys Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe | |
| 420 425 430 | |
| agt ggg atc cta tcc ctg gac ttg ctg cag gag ctg ttg gag cta cag | 1344 |
| Ser Gly Ile Leu Ser Leu Asp Leu Leu Gln Glu Leu Leu Glu Leu Gln | |
| 435 440 445 | |
| gag aga ctt cga cac ctg caa gtg tgg tcc cat gag gca cag cgc aac | 1392 |
| Glu Arg Leu Arg His Leu Gln Val Trp Ser His Glu Ala Gln Arg Asn | |
| 450 455 460 | |
| atc tcc ctc cag gac atc tgc tat gct ccc ctc aac ccg cat aac acc | 1440 |
| Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro His Asn Thr | |
| 465 470 475 480 | |
| agc ctc act gac tgc tgt gtc aac agc ctc ctt caa tac ttc cag aac | 1488 |
| Ser Leu Thr Asp Cys Cys Val Asn Ser Leu Leu Gln Tyr Phe Gln Asn | |
| 485 490 495 | |
| aac cac aca ctc ctg ctg ctc aca gcc aat cag act ctg aat ggc cag | 1536 |
| Asn His Thr Leu Leu Leu Leu Thr Ala Asn Gln Thr Leu Asn Gly Gln | |
| 500 505 510 | |
| acc tcc ctg gtg gac tgg aag gac cat ttc ctc tac tgt gcc aat gcc | 1584 |
| Thr Ser Leu Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala | |
| 515 520 525 | |
| cct ctc acg tac aaa gat ggc aca gcc ctg gcc ctg agc tgc ata gct | 1632 |
| Pro Leu Thr Tyr Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Ile Ala | |
| 530 535 540 | |
| gac tac ggg gca cct gtc ttc ccc ttc ctt gct gtt ggg ggc tac caa | 1680 |
| Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Val Gly Gly Tyr Gln | |
| 545 550 555 560 | |
| ggg acg gac tac tcg gag gca gaa gcc ctg atc ata acc ttc tct atc | 1728 |
| Gly Thr Asp Tyr Ser Glu Ala Glu Ala Leu Ile Ile Thr Phe Ser Ile | |
| 565 570 575 | |
| aat aac tac ccc gct gat gat ccc cgc atg gcc cac gcc aag ctc tgg | 1776 |
| Asn Asn Tyr Pro Ala Asp Asp Pro Arg Met Ala His Ala Lys Leu Trp | |
| 580 585 590 | |
| gag gag gct ttc ttg aag gaa atg caa tcc ttc cag aga agc aca gct | 1824 |
| Glu Glu Ala Phe Leu Lys Glu Met Gln Ser Phe Gln Arg Ser Thr Ala | |
| 595 600 605 | |
| gac aag ttc cag att gcg ttc tca gct gag cgt tct ctg gag gac gag | 1872 |
| Asp Lys Phe Gln Ile Ala Phe Ser Ala Glu Arg Ser Leu Glu Asp Glu | |
| 610 615 620 | |
| atc aat cgc act acc atc cag gac ctg cct gtc ttt gcc atc agc tac | 1920 |
| Ile Asn Arg Thr Thr Ile Gln Asp Leu Pro Val Phe Ala Ile Ser Tyr | |
| 625 630 635 640 | |
| ctt atc gtc ttc ctg tac atc tcc ctg gcc ctg ggc agc tac tcc aga | 1968 |
| Leu Ile Val Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Arg | |
| 645 650 655 | |

| | |
|--|------|
| tgg agc cga gtt gcg gtg gat tcc aag gct act ctg ggc cta ggt ggg Trp Ser Arg Val Ala Val Asp Ser Lys Ala Thr Leu Gly Leu Gly Gly | 2016 |
| 660 665 670 | |
| gtg gct gtt gtg ctg gga gca gtc gtc gct gcc atg ggc ttc tac tcc Val Ala Val Val Leu Gly Ala Val Val Ala Ala Met Gly Phe Tyr Ser | 2064 |
| 675 680 685 | |
| tac ctg ggt gtc ccc tcc tct ctg gtc atc att caa gtg gta cct ttc Tyr Leu Gly Val Pro Ser Ser Leu Val Ile Ile Gln Val Val Pro Phe | 2112 |
| 690 695 700 | |
| ctg gtg ctg gct gtg gga gct gac aac atc ttc atc ttt gtt ctt gag Leu Val Leu Ala Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu | 2160 |
| 705 710 715 720 | |
| tac cag agg ctg cct agg atg ccc ggg gag cag cga gag gct cac att Tyr Gln Arg Leu Pro Arg Met Pro Gly Glu Gln Arg Glu Ala His Ile | 2208 |
| 725 730 735 | |
| ggc cgc acc ctg ggt agt gtg gcc ccc agc atg ctg ctg tgc agc ctc Gly Arg Thr Leu Gly Ser Val Ala Pro Ser Met Leu Leu Cys Ser Leu | 2256 |
| 740 745 750 | |
| tct gag gcc atc tgc ttc ttt cta ggg gcc ctg acc tcc atg cca gct Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Ser Met Pro Ala | 2304 |
| 755 760 765 | |
| gtg agg acc ttt gcc ttg acc tct ggc tta gca atc atc ttt gac ttc Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Ile Ile Phe Asp Phe | 2352 |
| 770 775 780 | |
| ctg ctc cag atg aca gcc ttt gtg gcc ctg ctc tcc ctg gat agc aag Leu Leu Gln Met Thr Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys | 2400 |
| 785 790 795 800 | |
| agg cag gag gcc tct cgc ccc gac gtc gtg tgc tgc ttt tca agc cga Arg Gln Glu Ala Ser Arg Pro Asp Val Val Cys Cys Phe Ser Ser Arg | 2448 |
| 805 810 815 | |
| aat ctg ccc cca ccg aaa caa aaa gaa ggc ctc tta ctt tgc ttc ttc Asn Leu Pro Pro Pro Lys Gln Lys Glu Gly Leu Leu Leu Cys Phe Phe | 2496 |
| 820 825 830 | |
| cgc aag ata tac act ccc ttc ctg ctg cac aga ttc atc cgc cct gtt Arg Lys Ile Tyr Thr Pro Phe Leu Leu His Arg Phe Ile Arg Pro Val | 2544 |
| 835 840 845 | |
| gtg ctg ctg ctc ttt ctg gtc ctg ttt gga gca aac ctc tac tta atg Val Leu Leu Leu Phe Leu Val Leu Phe Gly Ala Asn Leu Tyr Leu Met | 2592 |
| 850 855 860 | |
| tgc aac atc agc gtg ggg ctg gac cag gat ctg gct ctg ccc aag gat Cys Asn Ile Ser Val Gly Leu Asp Gln Asp Leu Ala Leu Pro Lys Asp | 2640 |
| 865 870 875 880 | |
| tcc tac ctg ata gac tac ttc ctc ttt ctg aac cgg tac ttg gaa gtg Ser Tyr Leu Ile Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Leu Glu Val | 2688 |
| 885 890 895 | |
| ggg cct cca gtg tac ttt gac acc acc tca ggc tac aac ttt tcc acc | 2736 |

| | | | | | | | | | | | | | | | | |
|-----|------|-----|-----|-----|-----|------|------|-----|-----|-----|------|------|-----|-----|-----|------|
| Gly | Pro | Pro | Val | Tyr | Phe | Asp | Thr | Thr | Ser | Gly | Tyr | Asn | Phe | Ser | Thr | |
| | | | 900 | | | | | 905 | | | | | 910 | | | |
| gag | gca | ggc | atg | aac | gcc | att | tgc | tct | agt | gca | ggc | tgt | gag | agc | ttc | 2784 |
| Glu | Ala | Gly | Met | Asn | Ala | Ile | Cys | Ser | Ser | Ala | Gly | Cys | Glu | Ser | Phe | |
| | | 915 | | | | | 920 | | | | | 925 | | | | |
| tcc | cta | acc | cag | aaa | atc | cag | tat | gcc | agt | gaa | ttc | cct | aat | cag | tct | 2832 |
| Ser | Leu | Thr | Gln | Lys | Ile | Gln | Tyr | Ala | Ser | Glu | Phe | Pro | Asn | Gln | Ser | |
| | 930 | | | | | 935 | | | | | 940 | | | | | |
| tat | gtg | gct | att | gct | gca | tcc | tcc | tgg | gta | gat | gac | ttc | atc | gac | tgg | 2880 |
| Tyr | Val | Ala | Ile | Ala | Ala | Ser | Ser | Trp | Val | Asp | Asp | Phe | Ile | Asp | Trp | |
| 945 | | | | | 950 | | | | | 955 | | | | | 960 | |
| ctg | acc | cca | tcc | tcc | tcc | tgc | tgc | cgc | att | tat | acc | cgt | ggc | ccc | cat | 2928 |
| Leu | Thr | Pro | Ser | Ser | Ser | Cys | Cys | Arg | Ile | Tyr | Thr | Arg | Gly | Pro | His | |
| | | | 965 | | | | | 970 | | | | | | 975 | | |
| aaa | gat | gag | ttc | tgt | ccc | tca | acg | gat | act | tcc | ttc | aac | tgt | ctc | aaa | 2976 |
| Lys | Asp | Glu | Phe | Cys | Pro | Ser | Thr | Asp | Thr | Ser | Phe | Asn | Cys | Leu | Lys | |
| | | 980 | | | | | | 985 | | | | 990 | | | | |
| aac | tgc | atg | aac | cgc | act | ctg | ggt | ccc | gtg | aga | ccc | aca | aca | gaa | cag | 3024 |
| Asn | Cys | Met | Asn | Arg | Thr | Leu | Gly | Pro | Val | Arg | Pro | Thr | Thr | Glu | Gln | |
| | | 995 | | | | | 1000 | | | | | 1005 | | | | |
| ttt | cat | aag | tac | ctg | ccc | tgg | ttc | ctg | aat | gat | acg | ccc | aac | atc | | 3069 |
| Phe | His | Lys | Tyr | Leu | Pro | Trp | Phe | Leu | Asn | Asp | Thr | Pro | Asn | Ile | | |
| | 1010 | | | | | 1015 | | | | | 1020 | | | | | |
| aga | tgt | cct | aaa | ggg | ggc | cta | gca | gcg | tat | aga | acc | tct | gtg | aat | | 3114 |
| Arg | Cys | Pro | Lys | Gly | Gly | Leu | Ala | Ala | Tyr | Arg | Thr | Ser | Val | Asn | | |
| | 1025 | | | | | 1030 | | | | | 1035 | | | | | |
| ttg | agc | tca | gat | ggc | cag | att | ata | gcc | tcc | cag | ttc | atg | gcc | tac | | 3159 |
| Leu | Ser | Ser | Asp | Gly | Gln | Ile | Ile | Ala | Ser | Gln | Phe | Met | Ala | Tyr | | |
| | 1040 | | | | | 1045 | | | | | 1050 | | | | | |
| cac | aag | ccc | tta | cgg | aac | tca | cag | gac | ttt | aca | gaa | gct | ctc | cgg | | 3204 |
| His | Lys | Pro | Leu | Arg | Asn | Ser | Gln | Asp | Phe | Thr | Glu | Ala | Leu | Arg | | |
| | 1055 | | | | | 1060 | | | | | 1065 | | | | | |
| gca | tcc | cgg | ttg | cta | gca | gcc | aac | atc | aca | gct | gaa | cta | cgg | aag | | 3249 |
| Ala | Ser | Arg | Leu | Leu | Ala | Ala | Asn | Ile | Thr | Ala | Glu | Leu | Arg | Lys | | |
| | 1070 | | | | | 1075 | | | | | 1080 | | | | | |
| gtg | cct | ggg | aca | gat | ccc | aac | ttt | gag | gtc | ttc | cct | tac | acg | atc | | 3294 |
| Val | Pro | Gly | Thr | Asp | Pro | Asn | Phe | Glu | Val | Phe | Pro | Tyr | Thr | Ile | | |
| | 1085 | | | | | 1090 | | | | | 1095 | | | | | |
| tcc | aat | gtg | ttc | tac | cag | caa | tac | ctg | acg | gtt | ctc | cct | gag | gga | | 3339 |
| Ser | Asn | Val | Phe | Tyr | Gln | Gln | Tyr | Leu | Thr | Val | Leu | Pro | Glu | Gly | | |
| | 1100 | | | | | 1105 | | | | | 1110 | | | | | |
| atc | ttc | act | ctt | gct | ctc | tgc | ttc | gtg | ccc | acc | ttt | gtg | gtc | tgc | | 3384 |
| Ile | Phe | Thr | Leu | Ala | Leu | Cys | Phe | Val | Pro | Thr | Phe | Val | Val | Cys | | |
| | 1115 | | | | | 1120 | | | | | 1125 | | | | | |
| tac | ctc | cta | ctg | ggc | ctg | gac | ata | cgc | tca | ggc | atc | ctc | aac | ctg | | 3429 |
| Tyr | Leu | Leu | Leu | Gly | Leu | Asp | Ile | Arg | Ser | Gly | Ile | Leu | Asn | Leu | | |

| 1130 | 1135 | 1140 | |
|--|--|--|------|
| ctc tcc atc att atg atc Leu Ser Ile Ile Met Ile 1145 | ctc gtg gac acc atc Leu Val Asp Thr Ile 1150 | ggc ctc atg gct Gly Leu Met Ala 1155 | 3474 |
| gtg tgg ggt atc agc tac Val Trp Gly Ile Ser Tyr 1160 | aat gct gtg tcc ctc Asn Ala Val Ser Leu Ile 1165 | aac ctt gtc Asn Leu Val 1170 | 3519 |
| acg gca gtg ggc atg tct Thr Ala Val Gly Met Ser 1175 | gtg gag ttc gtg tcc Val Glu Phe Val Ser 1180 | cac att acc cgg His Ile Thr Arg 1185 | 3564 |
| tcc ttt gct gta agc acc Ser Phe Ala Val Ser Thr 1190 | aag cct acc cgg ctg Lys Pro Thr Arg Leu 1195 | gag aga gcc aaa Glu Arg Ala Lys 1200 | 3609 |
| gat gct act atc ttc atg Asp Ala Thr Ile Phe Met 1205 | ggc agt gcg gtg ttt Gly Ser Ala Val Phe 1210 | gct gga gtg gcc Ala Gly Val Ala 1215 | 3654 |
| atg acc aac ttc ccg ggc Met Thr Asn Phe Pro Gly 1220 | atc ctc atc ctg ggc Ile Leu Ile Leu Gly 1225 | ttt gct cag gcc Phe Ala Gln Ala 1230 | 3699 |
| cag ctt atc cag att ttc Gln Leu Ile Gln Ile Phe 1235 | ttc ttc cgc ctc aac Phe Phe Arg Leu Asn 1240 | ctc ctg atc acc Leu Leu Ile Thr 1245 | 3744 |
| ttg ctg ggt ctg cta cac Leu Leu Gly Leu Leu His 1250 | ggc ctg gtc ttc ctg Gly Leu Val Phe Leu 1255 | ccc gtt gtc ctc Pro Val Val Leu 1260 | 3789 |
| agc tat ctg ggg cca gat Ser Tyr Leu Gly Pro Asp 1265 | gtt aac caa gct ctg Val Asn Gln Ala Leu 1270 | gta ctg gag gag Val Leu Glu Glu 1275 | 3834 |
| aaa cta gcc act gag gca Lys Leu Ala Thr Glu Ala 1280 | gcc atg gtc tca gag Ala Met Val Ser Glu 1285 | cct tct tgc cca Pro Ser Cys Pro 1290 | 3879 |
| cag tac ccc ttc ccg gct Gln Tyr Pro Phe Pro Ala 1295 | gat gca aac acc agt Asp Ala Asn Thr Ser 1300 | gac tat gtt aac Asp Tyr Val Asn 1305 | 3924 |
| tac ggc ttt aat cca gaa Tyr Gly Phe Asn Pro Glu 1310 | ttt atc cct gaa att Phe Ile Pro Glu Ile 1315 | aat gct gct agc Asn Ala Ala Ser 1320 | 3969 |
| agc tct ctg ccc aaa agt Ser Ser Leu Pro Lys Ser 1325 | gac caa aag ttc taa Asp Gln Lys Phe 1330 | | 4002 |

<210> 12

<211> 1333

<212> PRT

<213> Mus sp.

<400> 12

Met Ala Ala Ala Trp Gln Gly Trp Leu Leu Trp Ala Leu Leu Leu Asn
1 5 10 15

Ser Ala Gln Gly Glu Leu Tyr Thr Pro Thr His Lys Ala Gly Phe Cys
20 25 30

Thr Phe Tyr Glu Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Gly Leu
35 40 45

Thr Ser Leu Ser Asn Ile Ser Cys Leu Ser Asn Thr Pro Ala Arg His
50 55 60

Val Thr Gly Asp His Leu Ala Leu Leu Gln Arg Val Cys Pro Arg Leu
65 70 75 80

Tyr Asn Gly Pro Asn Asp Thr Tyr Ala Cys Cys Ser Thr Lys Gln Leu
85 90 95

Val Ser Leu Asp Ser Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg
100 105 110

Cys Pro Ala Cys Ser Glu Asn Phe Val Ser Ile His Cys His Asn Thr
115 120 125

Cys Ser Pro Asp Gln Ser Leu Phe Ile Asn Val Thr Arg Val Val Gln
130 135 140

Arg Asp Pro Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr
145 150 155 160

Gln Arg Ser Phe Ala Glu Lys Ala Tyr Glu Ser Cys Ser Arg Val Arg
165 170 175

Ile Pro Ala Ala Ala Ser Leu Ala Val Gly Ser Met Cys Gly Val Tyr
180 185 190

Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp
195 200 205

Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu
210 215 220

| | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pro | Gly | Gln | Ala | Leu | Ala | Asp | Gly | Met | Lys | Pro | Leu | Asp | Gly | Lys | Ile | 225 | 230 | 235 | 240 |
| Thr | Pro | Cys | Asn | Glu | Ser | Gln | Gly | Glu | Asp | Ser | Ala | Ala | Cys | Ser | Cys | 245 | 250 | 255 | |
| Gln | Asp | Cys | Ala | Ala | Ser | Cys | Pro | Val | Ile | Pro | Pro | Pro | Pro | Ala | Leu | 260 | 265 | 270 | |
| Arg | Pro | Ser | Phe | Tyr | Met | Gly | Arg | Met | Pro | Gly | Trp | Leu | Ala | Leu | Ile | 275 | 280 | 285 | |
| Ile | Ile | Phe | Thr | Ala | Val | Phe | Val | Leu | Leu | Ser | Val | Val | Leu | Val | Tyr | 290 | 295 | 300 | |
| Leu | Arg | Val | Ala | Ser | Asn | Arg | Asn | Lys | Asn | Lys | Thr | Ala | Gly | Ser | Gln | 305 | 310 | 315 | 320 |
| Glu | Ala | Pro | Asn | Leu | Pro | Arg | Lys | Arg | Arg | Phe | Ser | Pro | His | Thr | Val | 325 | 330 | 335 | |
| Leu | Gly | Arg | Phe | Phe | Glu | Ser | Trp | Gly | Thr | Arg | Val | Ala | Ser | Trp | Pro | 340 | 345 | 350 | |
| Leu | Thr | Val | Leu | Ala | Leu | Ser | Phe | Ile | Val | Val | Ile | Ala | Leu | Ser | Val | 355 | 360 | 365 | |
| Gly | Leu | Thr | Phe | Ile | Glu | Leu | Thr | Thr | Asp | Pro | Val | Glu | Leu | Trp | Ser | 370 | 375 | 380 | |
| Ala | Pro | Lys | Ser | Gln | Ala | Arg | Lys | Glu | Lys | Ala | Phe | His | Asp | Glu | His | 385 | 390 | 395 | 400 |
| Phe | Gly | Pro | Phe | Phe | Arg | Thr | Asn | Gln | Ile | Phe | Val | Thr | Ala | Lys | Asn | 405 | 410 | 415 | |
| Arg | Ser | Ser | Tyr | Lys | Tyr | Asp | Ser | Leu | Leu | Leu | Gly | Pro | Lys | Asn | Phe | 420 | 425 | 430 | |
| Ser | Gly | Ile | Leu | Ser | Leu | Asp | Leu | Leu | Gln | Glu | Leu | Leu | Glu | Leu | Gln | 435 | 440 | 445 | |
| Glu | Arg | Leu | Arg | His | Leu | Gln | Val | Trp | Ser | His | Glu | Ala | Gln | Arg | Asn | 450 | 455 | 460 | |

Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro His Asn Thr
 465 470 475 480

Ser Leu Thr Asp Cys Cys Val Asn Ser Leu Leu Gln Tyr Phe Gln Asn
 485 490 495

Asn His Thr Leu Leu Leu Leu Thr Ala Asn Gln Thr Leu Asn Gly Gln
 500 505 510

Thr Ser Leu Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala
 515 520 525

Pro Leu Thr Tyr Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Ile Ala
 530 535 540

Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Val Gly Gly Tyr Gln
 545 550 555 560

Gly Thr Asp Tyr Ser Glu Ala Glu Ala Leu Ile Ile Thr Phe Ser Ile
 565 570 575

Asn Asn Tyr Pro Ala Asp Asp Pro Arg Met Ala His Ala Lys Leu Trp
 580 585 590

Glu Glu Ala Phe Leu Lys Glu Met Gln Ser Phe Gln Arg Ser Thr Ala
 595 600 605

Asp Lys Phe Gln Ile Ala Phe Ser Ala Glu Arg Ser Leu Glu Asp Glu
 610 615 620

Ile Asn Arg Thr Thr Ile Gln Asp Leu Pro Val Phe Ala Ile Ser Tyr
 625 630 635 640

Leu Ile Val Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Arg
 645 650 655

Trp Ser Arg Val Ala Val Asp Ser Lys Ala Thr Leu Gly Leu Gly Gly
 660 665 670

Val Ala Val Val Leu Gly Ala Val Val Ala Ala Met Gly Phe Tyr Ser
 675 680 685

Tyr Leu Gly Val Pro Ser Ser Leu Val Ile Ile Gln Val Val Pro Phe
 690 695 700

Leu Val Leu Ala Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 705 | | | | | 710 | | | | | 715 | | | | | 720 |
| Tyr | Gln | Arg | Leu | Pro | Arg | Met | Pro | Gly | Glu | Gln | Arg | Glu | Ala | His | Ile |
| | | | | 725 | | | | | 730 | | | | | 735 | |
| Gly | Arg | Thr | Leu | Gly | Ser | Val | Ala | Pro | Ser | Met | Leu | Leu | Cys | Ser | Leu |
| | | | 740 | | | | | 745 | | | | | 750 | | |
| Ser | Glu | Ala | Ile | Cys | Phe | Phe | Leu | Gly | Ala | Leu | Thr | Ser | Met | Pro | Ala |
| | | 755 | | | | | 760 | | | | | 765 | | | |
| Val | Arg | Thr | Phe | Ala | Leu | Thr | Ser | Gly | Leu | Ala | Ile | Ile | Phe | Asp | Phe |
| | 770 | | | | | 775 | | | | | 780 | | | | |
| Leu | Leu | Gln | Met | Thr | Ala | Phe | Val | Ala | Leu | Leu | Ser | Leu | Asp | Ser | Lys |
| 785 | | | | | 790 | | | | | 795 | | | | | 800 |
| Arg | Gln | Glu | Ala | Ser | Arg | Pro | Asp | Val | Val | Cys | Cys | Phe | Ser | Ser | Arg |
| | | | | 805 | | | | | 810 | | | | | 815 | |
| Asn | Leu | Pro | Pro | Pro | Lys | Gln | Lys | Glu | Gly | Leu | Leu | Leu | Cys | Phe | Phe |
| | | | 820 | | | | | 825 | | | | | 830 | | |
| Arg | Lys | Ile | Tyr | Thr | Pro | Phe | Leu | Leu | His | Arg | Phe | Ile | Arg | Pro | Val |
| | | 835 | | | | | 840 | | | | | 845 | | | |
| Val | Leu | Leu | Leu | Phe | Leu | Val | Leu | Phe | Gly | Ala | Asn | Leu | Tyr | Leu | Met |
| | 850 | | | | | 855 | | | | | 860 | | | | |
| Cys | Asn | Ile | Ser | Val | Gly | Leu | Asp | Gln | Asp | Leu | Ala | Leu | Pro | Lys | Asp |
| 865 | | | | | 870 | | | | | 875 | | | | | 880 |
| Ser | Tyr | Leu | Ile | Asp | Tyr | Phe | Leu | Phe | Leu | Asn | Arg | Tyr | Leu | Glu | Val |
| | | | | 885 | | | | | 890 | | | | | 895 | |
| Gly | Pro | Pro | Val | Tyr | Phe | Asp | Thr | Thr | Ser | Gly | Tyr | Asn | Phe | Ser | Thr |
| | | | 900 | | | | | 905 | | | | | 910 | | |
| Glu | Ala | Gly | Met | Asn | Ala | Ile | Cys | Ser | Ser | Ala | Gly | Cys | Glu | Ser | Phe |
| | | 915 | | | | | 920 | | | | | 925 | | | |
| Ser | Leu | Thr | Gln | Lys | Ile | Gln | Tyr | Ala | Ser | Glu | Phe | Pro | Asn | Gln | Ser |
| | 930 | | | | | 935 | | | | | 940 | | | | |
| Tyr | Val | Ala | Ile | Ala | Ala | Ser | Ser | Trp | Val | Asp | Asp | Phe | Ile | Asp | Trp |
| 945 | | | | | 950 | | | | | 955 | | | | | 960 |

Leu Thr Pro Ser Ser Ser Cys Cys Arg Ile Tyr Thr Arg Gly Pro His
 965 970 975

Lys Asp Glu Phe Cys Pro Ser Thr Asp Thr Ser Phe Asn Cys Leu Lys
 980 985 990

Asn Cys Met Asn Arg Thr Leu Gly Pro Val Arg Pro Thr Thr Glu Gln
 995 1000 1005

Phe His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Thr Pro Asn Ile
 1010 1015 1020

Arg Cys Pro Lys Gly Gly Leu Ala Ala Tyr Arg Thr Ser Val Asn
 1025 1030 1035

Leu Ser Ser Asp Gly Gln Ile Ile Ala Ser Gln Phe Met Ala Tyr
 1040 1045 1050

His Lys Pro Leu Arg Asn Ser Gln Asp Phe Thr Glu Ala Leu Arg
 1055 1060 1065

Ala Ser Arg Leu Leu Ala Ala Asn Ile Thr Ala Glu Leu Arg Lys
 1070 1075 1080

Val Pro Gly Thr Asp Pro Asn Phe Glu Val Phe Pro Tyr Thr Ile
 1085 1090 1095

Ser Asn Val Phe Tyr Gln Gln Tyr Leu Thr Val Leu Pro Glu Gly
 1100 1105 1110

Ile Phe Thr Leu Ala Leu Cys Phe Val Pro Thr Phe Val Val Cys
 1115 1120 1125

Tyr Leu Leu Leu Gly Leu Asp Ile Arg Ser Gly Ile Leu Asn Leu
 1130 1135 1140

Leu Ser Ile Ile Met Ile Leu Val Asp Thr Ile Gly Leu Met Ala
 1145 1150 1155

Val Trp Gly Ile Ser Tyr Asn Ala Val Ser Leu Ile Asn Leu Val
 1160 1165 1170

Thr Ala Val Gly Met Ser Val Glu Phe Val Ser His Ile Thr Arg
 1175 1180 1185

Ser Phe Ala Val Ser Thr Lys Pro Thr Arg Leu Glu Arg Ala Lys
 1190 1195 1200

Asp Ala Thr Ile Phe Met Gly Ser Ala Val Phe Ala Gly Val Ala
 1205 1210 1215

Met Thr Asn Phe Pro Gly Ile Leu Ile Leu Gly Phe Ala Gln Ala
 1220 1225 1230

Gln Leu Ile Gln Ile Phe Phe Phe Arg Leu Asn Leu Leu Ile Thr
 1235 1240 1245

Leu Leu Gly Leu Leu His Gly Leu Val Phe Leu Pro Val Val Leu
 1250 1255 1260

Ser Tyr Leu Gly Pro Asp Val Asn Gln Ala Leu Val Leu Glu Glu
 1265 1270 1275

Lys Leu Ala Thr Glu Ala Ala Met Val Ser Glu Pro Ser Cys Pro
 1280 1285 1290

Gln Tyr Pro Phe Pro Ala Asp Ala Asn Thr Ser Asp Tyr Val Asn
 1295 1300 1305

Tyr Gly Phe Asn Pro Glu Phe Ile Pro Glu Ile Asn Ala Ala Ser
 1310 1315 1320

Ser Ser Leu Pro Lys Ser Asp Gln Lys Phe
 1325 1330

<210> 13

<211> 3999

<212> DNA

<213> Mus sp.

| | |
|--|-----|
| <400> 13 | |
| atggcngcng cntggcargg ntggytynytn tgggcnytny tnytnaayws ngcncarggn | 60 |
| garytntaya cncnacnca yaargcnggn ttytgyacnt tytaygarga rtgyggnaar | 120 |
| aayccngary tnwsngngng nytnacnwsn ytnwsnaaya thwsntgyyt nwsnaayacn | 180 |
| ccngcnmgnc aygtnacngg ngaycayytn gcnytnytn c armgngtntg yccnmgnytn | 240 |

| | |
|--|------|
| tayaayggnc cnaaygayac ntaygcntgy tgywsnacna arcarytngt nwsnytngay | 300 |
| wsnwsnytnw snathacnaa rgcnytnytn acnmngtgyc cngcntgyws ngaraaytty | 360 |
| gtnwsnathc aytgycayaa yacntgywsn ccngaycarw snytnttyat haaygtnacn | 420 |
| mgngtngtnc armgngaycc nggncarytn ccngcngtng tngcntayga rgcnttytay | 480 |
| carmgnwsnt tygcngaraa rgcntaygar wsntgywsnm gngtnmgnat hccngcngcn | 540 |
| gcnwsnytn gngtnggnws natgtgygg ngtntayggw sngcnytntg yaaygncar | 600 |
| mgntggytna ayttycargg ngayacnggn aayggnytn cncnytn ga yathacntty | 660 |
| cayytnytn arcnggnca rgcnytn gcn gayggnatga arcnytn ga yggnaarath | 720 |
| acncntgya aygarwsnca rggngargay wsngcngcnt gywsntgyca rgaytgygc | 780 |
| gcnwsntgyc cngtnathcc nccncncnc gcnymngnc cnwsnttyta yatgggnmgn | 840 |
| atgccnggnt ggytn gcn nathathath ttyacngcng tnttygtnyt nytnwsngtn | 900 |
| gtnytngtnt ayytnmgngt ngcnwsnaay mgnaayaara ayaaracngc nggnwsncar | 960 |
| gargncncna ayytnccnmg naarmgnmgn ttywsnccnc ayacngtnyt nggnmgntty | 1020 |
| ttygarwsnt ggggnacnmg ngtn gcnwsn tggccnytna cngtnytn gcn nytnwsntty | 1080 |
| athgtngtna thgcnynws ngtn ggnnytn acnttyathg arytnacnac ngayccngtn | 1140 |
| garytn tggw sngcncncnaa rwsncargcn mgnaargara argcnttyca ygaygar cay | 1200 |
| ttyggncnt tyttymgnac naaycarath ttygtnacng cnaaraaymg nwsnwsntay | 1260 |
| aartaygayw snytnytnyt nggnccnaar aayttywsng gnathytnws nytn gayytn | 1320 |
| ytncargary tnytn garyt ncargarmgn ytnmgncayy tncargtn gwsncaygar | 1380 |
| gncarmgna ayathwsnyt ncargayath tgytaygcnc cnytnaaycc ncayaayacn | 1440 |
| wsnytnacng aytgytgygt naaywsnytn ytncartayt tycaraayaa ycayacnytn | 1500 |
| ytnytnytna cngcnaayca racnytnaay ggncaracnw snytn gtn ga ytggaargay | 1560 |
| cayttyytnt aytgygcnaa ygncncnytn acntayaarg ayggnacngc nytn gcn ytn | 1620 |
| wsntgyathg cngaytaygg ngcncngtn ttyccnttyy tngcngtngg nggntaycar | 1680 |
| ggnacngayt aywsngargc ngargcn ytn athathacnt tywsnathaa yaaytayccn | 1740 |
| gengaygayc cnmgntggc ncaygcnaar ytntgggarg argcnttyyt naargaratg | 1800 |
| carwsnttyc armgnwsnac ngcngayaar ttycarathg cnttywsngc ngarmgnwsn | 1860 |
| ytn gargayg arathaaymg nacnacnath cargayytnc cngtnnttygc nathwsntay | 1920 |
| ytnathgtnt tyytn tayat hwsnytn gcn ytn ggnwsnt aywsnmngtg gwsnmngtn | 1980 |
| gngtn gayw snaargcnac nytn ggnnytn ggngngngtng cngtn gtnyt ngngcngtn | 2040 |

| | | | | | | |
|-------------|-------------|------------|------------|-------------|-------------|------|
| gtngcngcna | tgggnttyta | ywsntayytn | ggngtnccnw | snwsnytngt | nathathcar | 2100 |
| gtngtnccnt | tyytngtnyt | ngcngtnngn | gcngayaaya | thttyathtt | ygtnytngar | 2160 |
| taycarmgny | tnccnmgnat | gcnggngar | carmgngarg | cncayathgg | nmgnacnytn | 2220 |
| ggnwsngtn | cncnwsnat | gytnytnthy | wsnytnwsng | argcnathtg | ytttyttytn | 2280 |
| ggngcnytna | cnwsnatgcc | ngcngtnmgn | acnttygcny | tnacnwsngg | nytnngcnath | 2340 |
| athttygayt | tyytnytnca | ratgacngcn | ttygtngcny | tnytnwsnyt | ngaywsnaar | 2400 |
| mgncargarg | cnwsnmgncc | ngaygtngtn | tgytgyttyw | snwsnmgnaa | yytnccncn | 2460 |
| ccnaarcara | argarggnyt | nytnytnthy | ttyttnmgn | arathtayac | nccnttytn | 2520 |
| ytncaymgnt | tyathmgnc | ngtnytn | ytnytnthy | tnytnytn | yggngcnaay | 2580 |
| ytnayytna | tgtgyaayat | hwsngtnngn | ytngaycarg | ayytnytn | nccnaargay | 2640 |
| wsntayytna | thgaytaytt | yytnthytn | aaymgntay | tnytnytn | nccncngtn | 2700 |
| tayttygaya | cnacnwsngg | ntayaayty | wsnacngarg | cnggnatgaa | ygnaththy | 2760 |
| wsnwsngcng | gntgygarws | nttywsnytn | acncaraara | thcartaygc | nwsngartty | 2820 |
| ccnaaycarw | sntaygtngc | nathgngcn | wsnwsntggg | tnytnytn | yathgaytgg | 2880 |
| ytnacncnw | snwsnwsntg | ytgymgnath | tayacnmng | gncncayaa | rgaygartty | 2940 |
| tgyccnwsna | cngayacnws | nttyaayty | ytnaaraayt | gyatgaaymg | nacnytnngn | 3000 |
| ccngtnmgnc | cnacnacnga | rcarttycay | aartayytn | cntggtyyt | naaygayacn | 3060 |
| ccnaayathm | gntgyccnaa | rgnggnytn | gcngcntaym | gnacnwsngt | naayytnwsn | 3120 |
| wsngayggnc | arathathgc | nwsncartty | atggcntayc | ayaarccnyt | nmgnaaywsn | 3180 |
| cargayttya | cngargcnyt | nmngncnwsn | mgnytnytn | cngcnaayat | hacngcngar | 3240 |
| ytnmgnaarg | tnccnggnac | ngayccnaay | ttygargtn | tyccntayac | nathwsnaay | 3300 |
| gtnttytayc | arcartayyt | nacngtnytn | ccngarggna | thtyacnyt | ngcnytnthy | 3360 |
| ttygtncna | cnttygtngt | ntgytayytn | ytnytnngny | tnytnytn | nwsnggnath | 3420 |
| ytnaayytny | tnwsnathat | hatgathytn | gtngayacna | thggnnytn | ggcngtnngg | 3480 |
| ggcnathwsnt | ayaaygcngt | nwsnytnath | aayytnytn | cngcngtnngg | natgwsngtn | 3540 |
| garttygtnw | sncayathac | nmgnwsntty | gcngtnwsna | cnaarccnac | nmgnnytn | 3600 |
| mgngcnaarg | aygcnacnat | httyatgggn | wsngcngtn | tygcnggngt | ngcnatgacn | 3660 |
| aayttyccng | gnathytnat | hytnngntty | gcncargcnc | arytnathca | rathttyty | 3720 |
| ttymgnytna | ayytnytnat | hacnytnytn | ggnytnytn | ayggnytn | nttyytnccn | 3780 |
| gtngtnytnw | sntayytnngg | nccngaygt | aaycargcny | tnytnytn | rgaraarytn | 3840 |

| | |
|--|------|
| gcnaacngarg cngcnatggt nwsngarccn wsntgyccnc artayccntt yccngcngay | 3900 |
| gcnaayacnw sngaytaygt naaytayggn ttayaayccng arttyathcc ngarathaay | 3960 |
| gcngcnwsnw snwsnytncc naarwsngay caraartty | 3999 |

<210> 14

<211> 20

<212> DNA

<213> Artificial sequence

<220>

<223> primer

| | |
|-----------------------|----|
| <400> 14 | |
| tcttcaccct tgctctttgc | 20 |

<210> 15

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

| | |
|----------------------------|----|
| <400> 15 | |
| aatgatggag agtaggttga ggat | 24 |

<210> 16

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

| | |
|------------------------------|----|
| <400> 16 | |
| tgcccacctt tgttgtctgc taccta | 26 |

<210> 17
 <211> 21
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> primer
 <400> 17
 atcgctgaca ggatgcagaa g 21

 <210> 18
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> primer
 <400> 18
 tcaggaggag caatgatctt ga 22

 <210> 19
 <211> 30
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> primer
 <400> 19
 agattactgc cctggctcct agcaccatta 30

 <210> 20
 <211> 20
 <212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 20
atcctcatcc tgggctttgc

20

<210> 21

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 21
gcaaggtgat caggaggttg a

21

<210> 22

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 22
cccagcttat ccagattttc ttcttcgcg

29

<210> 23

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 23
tcttcaccct tgctctttgc 20

<210> 24

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 24
aatgatggag agtaggttga ggat 24

<210> 25

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 25
tgcccacctt tgttgtctgc tacc 24

<210> 26

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 26
agcacctgtc cactgaagat ttc 23

<210> 27

<211> 21
<212> DNA
<213> Artificial Sequence

<220>

<223> primer

<400> 27
tggacgctga gcttcagttc t

21

<210> 28

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 28
cttctctgcg ctgcctcgat ggaa

24

<210> 29

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 29
agtaaaaagg gctcgcagga t

21

<210> 30

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 30

ggcagctggg gacatcagag a

21

<210> 31

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 31

aggaggccat gcaggcctac tctga

25

<210> 32

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 32

gagtccacgg tcagtccatg t

21

<210> 33

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 33

ttatgaacaa caatgccaag caa

23

<210> 34

<211> 34

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 34

agtccttagg tagtggctta gtccctggaa gctc

34

<210> 35

<211> 52

<212> DNA

<213> Artificial Sequence

<220>

<223> probe

<400> 35

gtaatacgac tcactatagg gccctgacgg tccttcctga gggaatcttc ac

52

<210> 36

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> probe

<400> 36

gtaatacgac tcactatagg gcctgggaag ttggtcatgg ccactccagc

50

<210> 37

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> FLAG tag

<400> 37

Asp Tyr Lys Asp Asp Asp Asp Lys
1 5

<210> 38

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> motif

<400> 38

Tyr Gln Arg Leu
1

<210> 39

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> antigen

<400> 39

Glu Gln Phe His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Pro Pro Asn
1 5 10 15

Ile Arg Cys

<210> 40

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> antigen

<400> 40

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Ala | Phe | Tyr | Gln | Arg | Ser | Phe | Ala | Glu | Lys | Ala | Tyr | Glu | Ser | Cys |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |

<210> 41

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> antigen

<400> 41

| | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Gln | Thr | Ser | Leu | Val | Asp | Trp | Lys | Asp | His | Phe | Leu | Tyr | Cys |
| 1 | | | | 5 | | | | | 10 | | | | | 15 |

<210> 42

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> antigen

<400> 42

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Cys | Ala | Asn | Ala | Pro | Leu | Thr | Phe | Lys | Asp | Gly | Thr | Ala | Leu | Ala | Leu |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |

Ser

<210> 43

<211> 5092

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (57) .. (4136)

<223>

<400> 43

```
cttggtgtgt cctgaggcct ggcctggctc cccgctgacc ccttcccaga cctggg atg      59
                                         Met
                                         1

gcg gag gcc ggc ctg agg ggc tgg ctg ctg tgg gcc ctg ctc ctg cgc      107
Ala Glu Ala Gly Leu Arg Gly Trp Leu Leu Trp Ala Leu Leu Leu Arg
                    5                      10                      15

ttg gcc cag agt gag cct tac aca acc atc cac cag cct ggc tac tgc      155
Leu Ala Gln Ser Glu Pro Tyr Thr Thr Ile His Gln Pro Gly Tyr Cys
                    20                      25                      30

gcc ttc tat gac gaa tgt ggg aag aac cca gag ctg tct gga agc ctc      203
Ala Phe Tyr Asp Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Ser Leu
                    35                      40                      45

atg aca ctc tcc aac gtg tcc tgc ctg tcc aac acg ccg gcc cgc aag      251
Met Thr Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg Lys
50                      55                      60                      65

atc aca ggt gat cac ctg atc cta tta cag aag atc tgc ccc cgc ctc      299
Ile Thr Gly Asp His Leu Ile Leu Leu Gln Lys Ile Cys Pro Arg Leu
                    70                      75                      80

tac acc ggc ccc aac acc caa gcc tgc tgc tcc gcc aag cag ctg gta      347
Tyr Thr Gly Pro Asn Thr Gln Ala Cys Cys Ser Ala Lys Gln Leu Val
                    85                      90                      95

tca ctg gaa gcg agt ctg tcg atc acc aag gcc ctc ctc acc cgc tgc      395
Ser Leu Glu Ala Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg Cys
                    100                     105                     110

cca gcc tgc tct gac aat ttt gtg aac ctg cac tgc cac aac acg tgc      443
Pro Ala Cys Ser Asp Asn Phe Val Asn Leu His Cys His Asn Thr Cys
                    115                     120                     125

agc ccc aat cag agc ctc ttc atc aat gtg acc cgc gtg gcc cag cta      491
Ser Pro Asn Gln Ser Leu Phe Ile Asn Val Thr Arg Val Ala Gln Leu
130                      135                      140                      145
```

| | |
|---|------|
| ggg gct gga caa ctc cca gct gtg gtg gcc tat gag gcc ttc tac cag | 539 |
| Gly Ala Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr Gln | |
| 150 155 160 | |
| cat agc ttt gcc gag cag agc tat gac tcc tgc agc cgt gtg cgc gtc | 587 |
| His Ser Phe Ala Glu Gln Ser Tyr Asp Ser Cys Ser Arg Val Arg Val | |
| 165 170 175 | |
| cct gca gct gcc acg ctg gct gtg ggc acc atg tgt ggc gtg tat ggc | 635 |
| Pro Ala Ala Ala Thr Leu Ala Val Gly Thr Met Cys Gly Val Tyr Gly | |
| 180 185 190 | |
| tct gcc ctt tgc aat gcc cag cgc tgg ctc aac ttc cag gga gac aca | 683 |
| Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp Thr | |
| 195 200 205 | |
| ggc aat ggt ctg gcc cca ctg gac atc acc ttc cac ctc ttg gag cct | 731 |
| Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu Pro | |
| 210 215 220 225 | |
| ggc cag gcc gtg ggg agt ggg att cag cct ctg aat gag ggg gtt gca | 779 |
| Gly Gln Ala Val Gly Ser Gly Ile Gln Pro Leu Asn Glu Gly Val Ala | |
| 230 235 240 | |
| cgt tgc aat gag tcc caa ggt gac gac gtg gcg acc tgc tcc tgc caa | 827 |
| Arg Cys Asn Glu Ser Gln Gly Asp Asp Val Ala Thr Cys Ser Cys Gln | |
| 245 250 255 | |
| gac tgt gct gca tcc tgt cct gcc ata gcc cgc ccc cag gcc ctc gac | 875 |
| Asp Cys Ala Ala Ser Cys Pro Ala Ile Ala Arg Pro Gln Ala Leu Asp | |
| 260 265 270 | |
| tcc acc ttc tac ctg ggc cag atg ccg ggc agt ctg gtc ctc atc atc | 923 |
| Ser Thr Phe Tyr Leu Gly Gln Met Pro Gly Ser Leu Val Leu Ile Ile | |
| 275 280 285 | |
| atc ctc tgc tct gtc ttc gct gtg gtc acc atc ctg ctt gtg gga ttc | 971 |
| Ile Leu Cys Ser Val Phe Ala Val Val Thr Ile Leu Leu Val Gly Phe | |
| 290 295 300 305 | |
| cgt gtg gcc ccc gcc agg gac aaa agc aag atg gtg gac ccc aag aag | 1019 |
| Arg Val Ala Pro Ala Arg Asp Lys Ser Lys Met Val Asp Pro Lys Lys | |
| 310 315 320 | |
| ggc acc agc ctc tct gac aag ctc agc ttc tcc acc cac acc ctc ctt | 1067 |
| Gly Thr Ser Leu Ser Asp Lys Leu Ser Phe Ser Thr His Thr Leu Leu | |
| 325 330 335 | |
| ggc cag ttc ttc cag ggc tgg ggc acg tgg gtg gct tgc tgg cct ctg | 1115 |
| Gly Gln Phe Phe Gln Gly Trp Gly Thr Trp Val Ala Ser Trp Pro Leu | |
| 340 345 350 | |
| acc atc ttg gtg cta tct gtc atc ccg gtg gtg gcc ttg gca gcg ggc | 1163 |
| Thr Ile Leu Val Leu Ser Val Ile Pro Val Val Ala Leu Ala Ala Gly | |
| 355 360 365 | |
| ctg gtc ttt aca gaa ctc act acg gac ccc gtg gag ctg tgg tgc gcc | 1211 |
| Leu Val Phe Thr Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser Ala | |
| 370 375 380 385 | |

| | |
|---|------|
| ccc aac agc caa gcc cgg agt gag aaa gct ttc cat gac cag cat ttc Pro Asn Ser Gln Ala Arg Ser Glu Lys Ala Phe His Asp Gln His Phe 390 395 400 | 1259 |
| ggc ccc ttc ttc cga acc aac cag gtg atc ctg acg gct cct aac cgg Gly Pro Phe Phe Arg Thr Asn Gln Val Ile Leu Thr Ala Pro Asn Arg 405 410 415 | 1307 |
| tcc agc tac agg tat gac tct ctg ctg ctg ggg ccc aag aac ttc agc Ser Ser Tyr Arg Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe Ser 420 425 430 | 1355 |
| gga atc ctg gac ctg gac ttg ctg ctg gag ctg cta gag ctg cag gag Gly Ile Leu Asp Leu Asp Leu Leu Leu Glu Leu Leu Glu Leu Gln Glu 435 440 445 | 1403 |
| agg ctg cgg cac ctc cag gta tgg tgg ccc gaa gca cag cgc aac atc Arg Leu Arg His Leu Gln Val Trp Ser Pro Glu Ala Gln Arg Asn Ile 450 455 460 465 | 1451 |
| tcc ctg cag gac atc tgc tac gcc ccc ctc aat ccg gac aat acc agt Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Asp Asn Thr Ser 470 475 480 | 1499 |
| ctc tac gac tgc tgc atc aac agc ctc ctg cag tat ttc cag aac aac Leu Tyr Asp Cys Cys Ile Asn Ser Leu Leu Gln Tyr Phe Gln Asn Asn 485 490 495 | 1547 |
| cgc acg ctc ctg ctg ctc aca gcc aac cag aca ctg atg ggg cag acc Arg Thr Leu Leu Leu Leu Thr Ala Asn Gln Thr Leu Met Gly Gln Thr 500 505 510 | 1595 |
| tcc caa gtc gac tgg aag gac cat ttt ctg tac tgt gcc aat gcc ccg Ser Gln Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala Pro 515 520 525 | 1643 |
| ctc acc ttc aag gat ggc aca gcc ctg gcc ctg agc tgc atg gct gac Leu Thr Phe Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Met Ala Asp 530 535 540 545 | 1691 |
| tac ggg gcc cct gtc ttc ccc ttc ctt gcc att ggg ggg tac aaa gga Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Ile Gly Gly Tyr Lys Gly 550 555 560 | 1739 |
| aag gac tat tct gag gca gag gcc ctg atc atg acg ttc tcc ctc aac Lys Asp Tyr Ser Glu Ala Glu Ala Leu Ile Met Thr Phe Ser Leu Asn 565 570 575 | 1787 |
| aat tac cct gcc ggg gac ccc cgt ctg gcc cag gcc aag ctg tgg gag Asn Tyr Pro Ala Gly Asp Pro Arg Leu Ala Gln Ala Lys Leu Trp Glu 580 585 590 | 1835 |
| gag gcc ttc tta gag gaa atg cga gcc ttc cag cgt cgg atg gct ggc Glu Ala Phe Leu Glu Glu Met Arg Ala Phe Gln Arg Arg Met Ala Gly 595 600 605 | 1883 |
| atg ttc cag gtc acg ttc atg gct gag cgc tct ctg gaa gac gag atc Met Phe Gln Val Thr Phe Met Ala Glu Arg Ser Leu Glu Asp Glu Ile 610 615 620 625 | 1931 |
| aat cgc acc aca gct gaa gac ctg ccc atc ttt gcc acc agc tac att | 1979 |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Asn | Arg | Thr | Thr | Ala | Glu | Asp | Leu | Pro | Ile | Phe | Ala | Thr | Ser | Tyr | Ile | |
| | | | | 630 | | | | | 635 | | | | | 640 | | |
| gtc | ata | ttc | ctg | tac | atc | tct | ctg | gcc | ctg | ggc | agc | tat | tcc | agc | tgg | 2027 |
| Val | Ile | Phe | Leu | Tyr | Ile | Ser | Leu | Ala | Leu | Gly | Ser | Tyr | Ser | Ser | Trp | |
| | | | 645 | | | | | 650 | | | | | 655 | | | |
| agc | cga | gtg | atg | gtg | gac | tcc | aag | gcc | acg | ctg | ggc | ctc | ggc | ggg | gtg | 2075 |
| Ser | Arg | Val | Met | Val | Asp | Ser | Lys | Ala | Thr | Leu | Gly | Leu | Gly | Gly | Val | |
| | | 660 | | | | | 665 | | | | | 670 | | | | |
| gcc | gtg | gtc | ctg | gga | gca | gtc | atg | gct | gcc | atg | ggc | ttc | ttc | tcc | tac | 2123 |
| Ala | Val | Val | Leu | Gly | Ala | Val | Met | Ala | Ala | Met | Gly | Phe | Phe | Ser | Tyr | |
| | 675 | | | | | 680 | | | | | 685 | | | | | |
| ttg | ggt | atc | cgc | tcc | tcc | ctg | gtc | atc | ctg | caa | gtg | gtt | cct | ttc | ctg | 2171 |
| Leu | Gly | Ile | Arg | Ser | Ser | Leu | Val | Ile | Leu | Gln | Val | Val | Pro | Phe | Leu | |
| 690 | | | | | 695 | | | | | 700 | | | | | 705 | |
| gtg | ctg | tcc | gtg | ggg | gct | gat | aac | atc | ttc | atc | ttt | gtt | ctc | gag | tac | 2219 |
| Val | Leu | Ser | Val | Gly | Ala | Asp | Asn | Ile | Phe | Ile | Phe | Val | Leu | Glu | Tyr | |
| | | | | 710 | | | | | 715 | | | | | 720 | | |
| cag | agg | ctg | ccc | cgg | agg | cct | ggg | gag | cca | cga | gag | gtc | cac | att | ggg | 2267 |
| Gln | Arg | Leu | Pro | Arg | Arg | Pro | Gly | Glu | Pro | Arg | Glu | Val | His | Ile | Gly | |
| | | | 725 | | | | | 730 | | | | | 735 | | | |
| cga | gcc | cta | ggc | agg | gtg | gct | ccc | agc | atg | ctg | ttg | tgc | agc | ctc | tct | 2315 |
| Arg | Ala | Leu | Gly | Arg | Val | Ala | Pro | Ser | Met | Leu | Leu | Cys | Ser | Leu | Ser | |
| | | 740 | | | | | 745 | | | | | 750 | | | | |
| gag | gcc | atc | tgc | ttc | ttc | cta | ggg | gcc | ctg | acc | ccc | atg | cca | gct | gtg | 2363 |
| Glu | Ala | Ile | Cys | Phe | Phe | Leu | Gly | Ala | Leu | Thr | Pro | Met | Pro | Ala | Val | |
| | 755 | | | | | 760 | | | | | 765 | | | | | |
| cgg | acc | ttt | gcc | ctg | acc | tct | ggc | ctt | gca | gtg | atc | ctt | gac | ttc | ctc | 2411 |
| Arg | Thr | Phe | Ala | Leu | Thr | Ser | Gly | Leu | Ala | Val | Ile | Leu | Asp | Phe | Leu | |
| 770 | | | | | 775 | | | | | 780 | | | | | 785 | |
| ctg | cag | atg | tca | gcc | ttt | gtg | gcc | ctg | ctc | tcc | ctg | gac | agc | aag | agg | 2459 |
| Leu | Gln | Met | Ser | Ala | Phe | Val | Ala | Leu | Leu | Ser | Leu | Asp | Ser | Lys | Arg | |
| | | | | 790 | | | | 795 | | | | | | 800 | | |
| cag | gag | gcc | tcc | cgg | ttg | gac | gtc | tgc | tgc | tgt | gtc | aag | ccc | cag | gag | 2507 |
| Gln | Glu | Ala | Ser | Arg | Leu | Asp | Val | Cys | Cys | Cys | Val | Lys | Pro | Gln | Glu | |
| | | | 805 | | | | | 810 | | | | | 815 | | | |
| ctg | ccc | ccg | cct | ggc | cag | gga | gag | ggg | ctc | ctg | ctt | ggc | ttc | ttc | caa | 2555 |
| Leu | Pro | Pro | Pro | Gly | Gln | Gly | Glu | Gly | Leu | Leu | Leu | Gly | Phe | Phe | Gln | |
| | | 820 | | | | | 825 | | | | | 830 | | | | |
| aag | gct | tat | gcc | ccc | ttc | ctg | ctg | cac | tgg | atc | act | cga | ggt | gtt | gtg | 2603 |
| Lys | Ala | Tyr | Ala | Pro | Phe | Leu | Leu | His | Trp | Ile | Thr | Arg | Gly | Val | Val | |
| | 835 | | | | | 840 | | | | | 845 | | | | | |
| ctg | ctg | ctg | ttt | ctc | gcc | ctg | ttc | gga | gtg | agc | ctc | tac | tcc | atg | tgc | 2651 |
| Leu | Leu | Leu | Phe | Leu | Ala | Leu | Phe | Gly | Val | Ser | Leu | Tyr | Ser | Met | Cys | |
| 850 | | | | | 855 | | | | | 860 | | | | | 865 | |
| cac | atc | agc | gtg | gga | ctg | gac | cag | gag | ctg | gcc | ctg | ccc | aag | gac | tcg | 2699 |
| His | Ile | Ser | Val | Gly | Leu | Asp | Gln | Glu | Leu | Ala | Leu | Pro | Lys | Asp | Ser | |

| 870 | 875 | 880 | |
|---|-----|-----|------|
| tac ctg ctt gac tat ttc ctc ttt ctg aac cgc tac ttc gag gtg ggg Tyr Leu Leu Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Phe Glu Val Gly 885 890 895 | | | 2747 |
| gcc ccg gtg tac ttt gtt acc acc ttg ggc tac aac ttc tcc agc gag Ala Pro Val Tyr Phe Val Thr Thr Leu Gly Tyr Asn Phe Ser Ser Glu 900 905 910 | | | 2795 |
| gct ggg atg aat gcc atc tgc tcc agt gca ggc tgc aac aac ttc tcc Ala Gly Met Asn Ala Ile Cys Ser Ser Ala Gly Cys Asn Asn Phe Ser 915 920 925 | | | 2843 |
| ttc acc cag aag atc cag tat gcc aca gag ttc cct gag cag tct tac Phe Thr Gln Lys Ile Gln Tyr Ala Thr Glu Phe Pro Glu Gln Ser Tyr 930 935 940 945 | | | 2891 |
| ctg gcc atc cct gcc tcc tcc tgg gtg gat gac ttc att gac tgg ctg Leu Ala Ile Pro Ala Ser Ser Trp Val Asp Asp Phe Ile Asp Trp Leu 950 955 960 | | | 2939 |
| acc ccg tcc tcc tgc tgc cgc ctt tat ata tct ggc ccc aat aag gac Thr Pro Ser Ser Cys Cys Arg Leu Tyr Ile Ser Gly Pro Asn Lys Asp 965 970 975 | | | 2987 |
| aag ttc tgc ccc tcg acc gtc aac tct ctg aac tgc cta aag aac tgc Lys Phe Cys Pro Ser Thr Val Asn Ser Leu Asn Cys Leu Lys Asn Cys 980 985 990 | | | 3035 |
| atg agc atc acg atg ggc tct gtg agg ccc tcg gtg gag cag ttc cat Met Ser Ile Thr Met Gly Ser Val Arg Pro Ser Val Glu Gln Phe His 995 1000 1005 | | | 3083 |
| aag tat ctt ccc tgg ttc ctg aac gac cgg ccc aac atc aaa tgt Lys Tyr Leu Pro Trp Phe Leu Asn Asp Arg Pro Asn Ile Lys Cys 1010 1015 1020 | | | 3128 |
| ccc aaa ggc ggc ctg gca gca tac agc acc tct gtg aac ttg act Pro Lys Gly Gly Leu Ala Ala Tyr Ser Thr Ser Val Asn Leu Thr 1025 1030 1035 | | | 3173 |
| tca gat ggc cag gtt tta gac aca gtt gcc att ctg tca ccc agg Ser Asp Gly Gln Val Leu Asp Thr Val Ala Ile Leu Ser Pro Arg 1040 1045 1050 | | | 3218 |
| ctg gag tac agt ggc aca atc tcg gct cac tgc aac ctc tac ctc Leu Glu Tyr Ser Gly Thr Ile Ser Ala His Cys Asn Leu Tyr Leu 1055 1060 1065 | | | 3263 |
| ctg gat tca gcc tcc agg ttc atg gcc tat cac aag ccc ctg aaa Leu Asp Ser Ala Ser Arg Phe Met Ala Tyr His Lys Pro Leu Lys 1070 1075 1080 | | | 3308 |
| aac tca cag gat tac aca gaa gct ctg cgg gca gct cga gag ctg Asn Ser Gln Asp Tyr Thr Glu Ala Leu Arg Ala Ala Arg Glu Leu 1085 1090 1095 | | | 3353 |
| gca gcc aac atc act gct gac ctg cgg aaa gtg cct gga aca gac Ala Ala Asn Ile Thr Ala Asp Leu Arg Lys Val Pro Gly Thr Asp 1100 1105 1110 | | | 3398 |

| | | | | | | | | | | | | | | | |
|--------------------|------------|------------|------------|------------|--------------------|------------|------------|------------|------------|--------------------|------------|------------|------------|------------|------|
| ccg Pro 1115 | gct Ala | ttt Phe | gag Glu | gtc Val | ttc Phe 1120 | ccc Pro | tac Tyr | acg Thr | atc Ile | acc Thr 1125 | aat Asn | gtg Val | ttt Phe | tat Tyr | 3443 |
| gag Glu 1130 | cag Gln | tac Tyr | ctg Leu | acc Thr | atc Ile 1135 | ctc Leu | cct Pro | gag Glu | ggg Gly | ctc Leu 1140 | ttc Phe | atg Met | ctc Leu | agc Ser | 3488 |
| ctc Leu 1145 | tgc Cys | ctt Leu | gtg Val | ccc Pro | acc Thr 1150 | ttc Phe | gct Ala | gtc Val | tcc Ser | tgc Cys 1155 | ctc Leu | ctg Leu | ctg Leu | ggc Gly | 3533 |
| ctg Leu 1160 | gac Asp | ctg Leu | cgc Arg | tcc Ser | ggc Gly 1165 | ctc Leu | ctc Leu | aac Asn | ctg Leu | ctc Leu 1170 | tcc Ser | att Ile | gtc Val | atg Met | 3578 |
| atc Ile 1175 | ctc Leu | gtg Val | gac Asp | act Thr | gtc Val 1180 | ggc Gly | ttc Phe | atg Met | gcc Ala | ctg Leu 1185 | tgg Trp | ggc Gly | atc Ile | agt Ser | 3623 |
| tac Tyr 1190 | aat Asn | gct Ala | gtg Val | tcc Ser | ctc Leu 1195 | atc Ile | aac Asn | ctg Leu | gtc Val | tgc Ser 1200 | gcg Ala | gtg Val | ggc Gly | atg Met | 3668 |
| tct Ser 1205 | gtg Val | gag Glu | ttt Phe | gtg Val | tcc Ser 1210 | cac His | att Ile | acc Thr | cgc Arg | tcc Ser 1215 | ttt Phe | gcc Ala | atc Ile | agc Ser | 3713 |
| acc Thr 1220 | aag Lys | ccc Pro | acc Thr | tgg Trp | ctg Leu 1225 | gag Glu | agg Arg | gcc Ala | aaa Lys | gag Glu 1230 | gcc Ala | acc Thr | atc Ile | tct Ser | 3758 |
| atg Met 1235 | gga Gly | agt Ser | gcg Ala | gtg Val | ttt Phe 1240 | gca Ala | ggg Gly | gtg Val | gcc Ala | atg Met 1245 | acc Thr | aac Asn | ctg Leu | cct Pro | 3803 |
| ggc Gly 1250 | atc Ile | ctt Leu | gtc Val | ctg Leu | ggc Gly 1255 | ctc Leu | gcc Ala | aag Lys | gcc Ala | cag Gln 1260 | ctc Leu | att Ile | cag Gln | atc Ile | 3848 |
| ttc Phe 1265 | ttc Phe | ttc Phe | cgc Arg | ctc Leu | aac Asn 1270 | ctc Leu | ctg Leu | atc Ile | act Thr | ctg Leu 1275 | ctg Leu | ggc Gly | ctg Leu | ctg Leu | 3893 |
| cat His 1280 | ggc Gly | ttg Leu | gtc Val | ttc Phe | ctg Leu 1285 | ccc Pro | gtc Val | atc Ile | ctc Leu | agc Ser 1290 | tac Tyr | gtg Val | ggg Gly | cct Pro | 3938 |
| gac Asp 1295 | gtt Val | aac Asn | ccg Pro | gct Ala | ctg Leu 1300 | gca Ala | ctg Leu | gag Glu | cag Gln | aag Lys 1305 | cgg Arg | gct Ala | gag Glu | gag Glu | 3983 |
| gcg Ala 1310 | gtg Val | gca Ala | gca Ala | gtc Val | atg Met 1315 | gtg Val | gcc Ala | tct Ser | tgc Cys | cca Pro 1320 | aat Asn | cac His | ccc Pro | tcc Ser | 4028 |
| cga Arg 1325 | gtc Val | tcc Ser | aca Thr | gct Ala | gac Asp 1330 | aac Asn | atc Ile | tat Tyr | gtc Val | aac Asn 1335 | cac His | agc Ser | ttt Phe | gaa Glu | 4073 |

```

ggt  tct atc aaa ggt gct  ggt gcc atc agc aac  ttc ttg ccc aac      4118
Gly  Ser Ile Lys Gly Ala  Gly Ala Ile Ser Asn  Phe Leu Pro Asn
1340                               1345                     1350

aat  ggg cgg cag ttc tga tacagccaga ggccctgtct aggctctatg      4166
Asn  Gly Arg Gln Phe
1355

gccctgaacc,aaagggttat ggggatcttc cttgtgactg ccccttgaca cacgccctcc      4226

tcaaatccta ggggaggcca ttcccatgag actgcctgtc actggaggat ggcctgctct      4286

tgaggatatcc aggcagcacc actgatggct cctctgctcc catagtgggt ccccagtttc      4346

caagtcacct aggccttggg cagtgcctcc tcctgggcct gggctctggaa gttggcagga      4406

acagacacac tccatgtttg tcccacactc actcactttc ctaggagccc acttctcatc      4466

caacttttcc cttctcagtt cctctctcga aagtcttaat tctgtgtcag taagtcttta      4526

acacgtagca gtgtccctga gaacacagac aatgaccact accctgggtg tgatatcaca      4586

ggaggccaga gagaggcaaa ggctcaggcc aagagccaac gctgtgggag gccggtcggc      4646

agccactccc tccagggcgc acctgcaggt ctgccatcca cggccttttc tggcaagaga      4706

agggccccagg aaggatgctc tcataaggcc caggaaggat gctctcataa gcaccttggt      4766

catggattag cccctcctgg aaaatgggtg tgggttttgt ctccagctcc aatacttatt      4826

aaggctgttg ctgccagtca aggccaccca ggagtctgaa ggctgggagc tcttggggct      4886

gggctgggtcc tcccatcttc acctcgggcc tggatcccag gcctcaaacc agcccaaccc      4946

gagcttttgg acagctctcc agaagcatga actgcagtgg agatgaagat cctgggtctg      5006

tgctgtgcac ataggtgttt aataaacatt tgttggcaga aaaaaaaaaa aaaaaaaaaa      5066

aaaaaaaaaa aaaaaaaaaa aaaaaa      5092

```

<210> 44

<211> 1359

<212> PRT

<213> Homo sapiens

<400> 44

```

Met Ala Glu Ala Gly Leu Arg Gly Trp Leu Leu Trp Ala Leu Leu Leu
1          5          10          15

```

```

Arg Leu Ala Gln Ser Glu Pro Tyr Thr Thr Ile His Gln Pro Gly Tyr
          20          25          30

```


Cys Ala Phe Tyr Asp Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Ser
 35 40 45
 Leu Met Thr Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg
 50 55 60
 Lys Ile Thr Gly Asp His Leu Ile Leu Leu Gln Lys Ile Cys Pro Arg
 65 70 75 80
 Leu Tyr Thr Gly Pro Asn Thr Gln Ala Cys Cys Ser Ala Lys Gln Leu
 85 90 95
 Val Ser Leu Glu Ala Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg
 100 105 110
 Cys Pro Ala Cys Ser Asp Asn Phe Val Asn Leu His Cys His Asn Thr
 115 120 125
 Cys Ser Pro Asn Gln Ser Leu Phe Ile Asn Val Thr Arg Val Ala Gln
 130 135 140
 Leu Gly Ala Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr
 145 150 155 160
 Gln His Ser Phe Ala Glu Gln Ser Tyr Asp Ser Cys Ser Arg Val Arg
 165 170 175
 Val Pro Ala Ala Ala Thr Leu Ala Val Gly Thr Met Cys Gly Val Tyr
 180 185 190
 Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp
 195 200 205
 Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu
 210 215 220
 Pro Gly Gln Ala Val Gly Ser Gly Ile Gln Pro Leu Asn Glu Gly Val
 225 230 235 240
 Ala Arg Cys Asn Glu Ser Gln Gly Asp Asp Val Ala Thr Cys Ser Cys
 245 250 255
 Gln Asp Cys Ala Ala Ser Cys Pro Ala Ile Ala Arg Pro Gln Ala Leu
 260 265 270
 Asp Ser Thr Phe Tyr Leu Gly Gln Met Pro Gly Ser Leu Val Leu Ile

| 275 | 280 | 285 |
|--|-----|-----|
| Ile Ile Leu Cys Ser Val Phe Ala Val Val Thr Ile Leu Leu Val Gly 290 295 300 | | |
| Phe Arg Val Ala Pro Ala Arg Asp Lys Ser Lys Met Val Asp Pro Lys 305 310 315 320 | | |
| Lys Gly Thr Ser Leu Ser Asp Lys Leu Ser Phe Ser Thr His Thr Leu 325 330 335 | | |
| Leu Gly Gln Phe Phe Gln Gly Trp Gly Thr Trp Val Ala Ser Trp Pro 340 345 350 | | |
| Leu Thr Ile Leu Val Leu Ser Val Ile Pro Val Val Ala Leu Ala Ala 355 360 365 | | |
| Gly Leu Val Phe Thr Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser 370 375 380 | | |
| Ala Pro Asn Ser Gln Ala Arg Ser Glu Lys Ala Phe His Asp Gln His 385 390 395 400 | | |
| Phe Gly Pro Phe Phe Arg Thr Asn Gln Val Ile Leu Thr Ala Pro Asn 405 410 415 | | |
| Arg Ser Ser Tyr Arg Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe 420 425 430 | | |
| Ser Gly Ile Leu Asp Leu Asp Leu Leu Leu Glu Leu Leu Glu Leu Gln 435 440 445 | | |
| Glu Arg Leu Arg His Leu Gln Val Trp Ser Pro Glu Ala Gln Arg Asn 450 455 460 | | |
| Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Asp Asn Thr 465 470 475 480 | | |
| Ser Leu Tyr Asp Cys Cys Ile Asn Ser Leu Leu Gln Tyr Phe Gln Asn 485 490 495 | | |
| Asn Arg Thr Leu Leu Leu Leu Thr Ala Asn Gln Thr Leu Met Gly Gln 500 505 510 | | |
| Thr Ser Gln Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala 515 520 525 | | |

Pro Leu Thr Phe Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Met Ala
 530 535 540

Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Ile Gly Gly Tyr Lys
 545 550 555 560

Gly Lys Asp Tyr Ser Glu Ala Glu Ala Leu Ile Met Thr Phe Ser Leu
 565 570 575

Asn Asn Tyr Pro Ala Gly Asp Pro Arg Leu Ala Gln Ala Lys Leu Trp
 580 585 590

Glu Glu Ala Phe Leu Glu Glu Met Arg Ala Phe Gln Arg Arg Met Ala
 595 600 605

Gly Met Phe Gln Val Thr Phe Met Ala Glu Arg Ser Leu Glu Asp Glu
 610 615 620

Ile Asn Arg Thr Thr Ala Glu Asp Leu Pro Ile Phe Ala Thr Ser Tyr
 625 630 635 640

Ile Val Ile Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Ser
 645 650 655

Trp Ser Arg Val Met Val Asp Ser Lys Ala Thr Leu Gly Leu Gly Gly
 660 665 670

Val Ala Val Val Leu Gly Ala Val Met Ala Ala Met Gly Phe Phe Ser
 675 680 685

Tyr Leu Gly Ile Arg Ser Ser Leu Val Ile Leu Gln Val Val Pro Phe
 690 695 700

Leu Val Leu Ser Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu
 705 710 715 720

Tyr Gln Arg Leu Pro Arg Arg Pro Gly Glu Pro Arg Glu Val His Ile
 725 730 735

Gly Arg Ala Leu Gly Arg Val Ala Pro Ser Met Leu Leu Cys Ser Leu
 740 745 750

Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Pro Met Pro Ala
 755 760 765

| | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|-----|
| Val | Arg | Thr | Phe | Ala | Leu | Thr | Ser | Gly | Leu | Ala | Val | Ile | Leu | Asp | Phe | 770 | 775 | 780 | |
| Leu | Leu | Gln | Met | Ser | Ala | Phe | Val | Ala | Leu | Leu | Ser | Leu | Asp | Ser | Lys | 785 | 790 | 795 | 800 |
| Arg | Gln | Glu | Ala | Ser | Arg | Leu | Asp | Val | Cys | Cys | Cys | Val | Lys | Pro | Gln | 805 | 810 | 815 | |
| Glu | Leu | Pro | Pro | Pro | Gly | Gln | Gly | Glu | Gly | Leu | Leu | Leu | Gly | Phe | Phe | 820 | 825 | 830 | |
| Gln | Lys | Ala | Tyr | Ala | Pro | Phe | Leu | Leu | His | Trp | Ile | Thr | Arg | Gly | Val | 835 | 840 | 845 | |
| Val | Leu | Leu | Leu | Phe | Leu | Ala | Leu | Phe | Gly | Val | Ser | Leu | Tyr | Ser | Met | 850 | 855 | 860 | |
| Cys | His | Ile | Ser | Val | Gly | Leu | Asp | Gln | Glu | Leu | Ala | Leu | Pro | Lys | Asp | 865 | 870 | 875 | 880 |
| Ser | Tyr | Leu | Leu | Asp | Tyr | Phe | Leu | Phe | Leu | Asn | Arg | Tyr | Phe | Glu | Val | 885 | 890 | 895 | |
| Gly | Ala | Pro | Val | Tyr | Phe | Val | Thr | Thr | Leu | Gly | Tyr | Asn | Phe | Ser | Ser | 900 | 905 | 910 | |
| Glu | Ala | Gly | Met | Asn | Ala | Ile | Cys | Ser | Ser | Ala | Gly | Cys | Asn | Asn | Phe | 915 | 920 | 925 | |
| Ser | Phe | Thr | Gln | Lys | Ile | Gln | Tyr | Ala | Thr | Glu | Phe | Pro | Glu | Gln | Ser | 930 | 935 | 940 | |
| Tyr | Leu | Ala | Ile | Pro | Ala | Ser | Ser | Trp | Val | Asp | Asp | Phe | Ile | Asp | Trp | 945 | 950 | 955 | 960 |
| Leu | Thr | Pro | Ser | Ser | Cys | Cys | Arg | Leu | Tyr | Ile | Ser | Gly | Pro | Asn | Lys | 965 | 970 | 975 | |
| Asp | Lys | Phe | Cys | Pro | Ser | Thr | Val | Asn | Ser | Leu | Asn | Cys | Leu | Lys | Asn | 980 | 985 | 990 | |
| Cys | Met | Ser | Ile | Thr | Met | Gly | Ser | Val | Arg | Pro | Ser | Val | Glu | Gln | Phe | 995 | 1000 | 1005 | |

| | | | | | | | | | | | | | | |
|------|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|
| His | Lys | Tyr | Leu | Pro | Trp | Phe | Leu | Asn | Asp | Arg | Pro | Asn | Ile | Lys |
| 1010 | | | | | | 1015 | | | | | 1020 | | | |
| Cys | Pro | Lys | Gly | Gly | Leu | Ala | Ala | Tyr | Ser | Thr | Ser | Val | Asn | Leu |
| 1025 | | | | | | 1030 | | | | | 1035 | | | |
| Thr | Ser | Asp | Gly | Gln | Val | Leu | Asp | Thr | Val | Ala | Ile | Leu | Ser | Pro |
| 1040 | | | | | | 1045 | | | | | 1050 | | | |
| Arg | Leu | Glu | Tyr | Ser | Gly | Thr | Ile | Ser | Ala | His | Cys | Asn | Leu | Tyr |
| 1055 | | | | | | 1060 | | | | | 1065 | | | |
| Leu | Leu | Asp | Ser | Ala | Ser | Arg | Phe | Met | Ala | Tyr | His | Lys | Pro | Leu |
| 1070 | | | | | | 1075 | | | | | 1080 | | | |
| Lys | Asn | Ser | Gln | Asp | Tyr | Thr | Glu | Ala | Leu | Arg | Ala | Ala | Arg | Glu |
| 1085 | | | | | | 1090 | | | | | 1095 | | | |
| Leu | Ala | Ala | Asn | Ile | Thr | Ala | Asp | Leu | Arg | Lys | Val | Pro | Gly | Thr |
| 1100 | | | | | | 1105 | | | | | 1110 | | | |
| Asp | Pro | Ala | Phe | Glu | Val | Phe | Pro | Tyr | Thr | Ile | Thr | Asn | Val | Phe |
| 1115 | | | | | | 1120 | | | | | 1125 | | | |
| Tyr | Glu | Gln | Tyr | Leu | Thr | Ile | Leu | Pro | Glu | Gly | Leu | Phe | Met | Leu |
| 1130 | | | | | | 1135 | | | | | 1140 | | | |
| Ser | Leu | Cys | Leu | Val | Pro | Thr | Phe | Ala | Val | Ser | Cys | Leu | Leu | Leu |
| 1145 | | | | | | 1150 | | | | | 1155 | | | |
| Gly | Leu | Asp | Leu | Arg | Ser | Gly | Leu | Leu | Asn | Leu | Leu | Ser | Ile | Val |
| 1160 | | | | | | 1165 | | | | | 1170 | | | |
| Met | Ile | Leu | Val | Asp | Thr | Val | Gly | Phe | Met | Ala | Leu | Trp | Gly | Ile |
| 1175 | | | | | | 1180 | | | | | 1185 | | | |
| Ser | Tyr | Asn | Ala | Val | Ser | Leu | Ile | Asn | Leu | Val | Ser | Ala | Val | Gly |
| 1190 | | | | | | 1195 | | | | | 1200 | | | |
| Met | Ser | Val | Glu | Phe | Val | Ser | His | Ile | Thr | Arg | Ser | Phe | Ala | Ile |
| 1205 | | | | | | 1210 | | | | | 1215 | | | |
| Ser | Thr | Lys | Pro | Thr | Trp | Leu | Glu | Arg | Ala | Lys | Glu | Ala | Thr | Ile |
| 1220 | | | | | | 1225 | | | | | 1230 | | | |
| Ser | Met | Gly | Ser | Ala | Val | Phe | Ala | Gly | Val | Ala | Met | Thr | Asn | Leu |

| | | | | |
|---------|-------------|---------|-----------------|---------------------|
| 1235 | | 1240 | | 1245 |
| Pro Gly | Ile Leu Val | Leu Gly | Leu Ala Lys | Ala Gln Leu Ile Gln |
| 1250 | | 1255 | | 1260 |
| Ile Phe | Phe Phe Arg | Leu Asn | Leu Leu Ile Thr | Leu Leu Gly Leu |
| 1265 | | 1270 | | 1275 |
| Leu His | Gly Leu Val | Phe Leu | Pro Val Ile Leu | Ser Tyr Val Gly |
| 1280 | | 1285 | | 1290 |
| Pro Asp | Val Asn Pro | Ala Leu | Ala Leu Glu Gln | Lys Arg Ala Glu |
| 1295 | | 1300 | | 1305 |
| Glu Ala | Val Ala Ala | Val Met | Val Ala Ser Cys | Pro Asn His Pro |
| 1310 | | 1315 | | 1320 |
| Ser Arg | Val Ser Thr | Ala Asp | Asn Ile Tyr Val | Asn His Ser Phe |
| 1325 | | 1330 | | 1335 |
| Glu Gly | Ser Ile Lys | Gly Ala | Gly Ala Ile Ser | Asn Phe Leu Pro |
| 1340 | | 1345 | | 1350 |

Asn Asn Gly Arg Gln Phe
1355

<210> 45

<211> 4471

<212> DNA

<213> Mus musculus

| | |
|---|-----|
| <400> 45 | |
| ggatcacttc ctggctctgg gatggcagct gcctggcagg gatggctgct ctgggccctg | 60 |
| ctcctgaatt cggcccaggg tgagctctac acaccactc acaaagctgg cttctgcacc | 120 |
| ttttatgaag agtgtgggaa gaaccagag ctttctggag gcctcacatc actatccaat | 180 |
| atctcctgct tgtctaatac cccagccccg ccatgtcaca ggtgaccacc tggctcttct | 240 |
| ccagcgcgtc tgtccccgcc tatacaatgg cccaatgac acctatgcct gttgctctac | 300 |
| caagcagctg gtgtcattag acagtagcct gtctatcacc aaggccctcc ttacacgctg | 360 |
| cccggcatgc tctgaaaatt ttgtgagcat aactgtcat aatacctgca gccctgacca | 420 |
| gagcctcttc atcaatgtta ctcgcgtggt tcagcgggac cctggacagc ttcctgctgt | 480 |

| | |
|--|------|
| ggtggcctat gaggcctttt atcaacgcag ttttgcagag aaggcctatg agtcctgtag | 540 |
| ccgggtgcgc atccctgcag ctgcctcgct ggctgtgggc agcatgtgtg gagtgtatgg | 600 |
| ctctgccctc tgcaatgctc agcgcctggc tcaacttcca aggagacaca gggaatggcc | 660 |
| tggctccgct ggacatcacc ttccacctct tggagcctgg ccaggccctg gcagatggga | 720 |
| tgaagccact ggatgggaag atcaaaccct gcaatgagtc ccagggtgaa gactcggcag | 780 |
| cctgttcctg ccaggactgt gcagcatcct gccctgtcat cctccgccc ccggccctgc | 840 |
| gcccttcttt ctacatgggt cgaatgccag gctggctggc tctcatcatc atcttcactg | 900 |
| ctgtctttgt attgctctct gttgtccttg tgtatctccg agtggcttcc aacaggaaca | 960 |
| agaacaagac agcaggctcc caggaagccc ccaacctccc tcgtaagcgc agattctcac | 1020 |
| ctcacactgt ccttggccgg ttcttcgaga gctggggaac aatgggtggcc tcatggccac | 1080 |
| tactgtctt ggactgtcc ttcatagttg tgatagcctt gtcagtaggc ctgaccttta | 1140 |
| tagaactcac cacagacct gtggaactgt ggtcggcccc taaaagccaa gcccggaag | 1200 |
| aaaaggcttt ccatgacgag cattttggcc ctttcttcg aaccaaccag atttttgtga | 1260 |
| cagctaagaa caggctccagc tacaagtacg actccctgct gctagggccc aagaacttca | 1320 |
| gtgggatcct atccctggac ttgctgcagg agctgttgga gctacaggag agacttcgac | 1380 |
| acctgcaagt gtggtcccat gaggcacagc gcaacatctc cctccaggac atctgctatg | 1440 |
| ctccctcaa accgcataac accagcctca ctgactgctg tgtcaacagc ctcttcaat | 1500 |
| acttccagaa caaccacaca ctctgctgc tcacagccaa ccagactctg aatggccaga | 1560 |
| cctccctggg ggactggaag gaccatttcc tctactgtgc caatgccct ctcacgtaca | 1620 |
| aagatggcac agccctggcc ctgagctgca tagctgacta cggggcgcct gtcttcccct | 1680 |
| tccttgctgt tgggggctac caagggacgg actactcgga ggcagaagcc ctgatcataa | 1740 |
| ccttctctat caataactac cccgctgatg atccccgcat ggcccacgcc aagctctggg | 1800 |
| aggaggcttt cttgaaggaa atgcaatcct tccagagaag cacagctgac aagttccaga | 1860 |
| ttgcgttctc agctgagcgt tctctggagg acgagatcaa tcgcactacc atccaggacc | 1920 |
| tgctgtctt tgccatcagc taccttatcg tcttcctgta catctccctg gccctgggca | 1980 |
| gctactccag atggagccga gttgcggtgg attccaaggc tactctgggc ctaggtgggg | 2040 |
| tggctgttgt gctgggagca gtcgtggctg ccatgggctt ctactcctac ctgggtgtcc | 2100 |
| cctcctctct ggtcatcatt caagtggtag ctttcctggg gctggctgtg ggagctgaca | 2160 |
| acatcttcat ctttgttctt gagtaccaga ggctgcctag gatgcccggg gagcagcgag | 2220 |
| aggctcacat tggccgcacc ctgggtagtg tggccccag catgctgctg tgcagcctct | 2280 |
| ctgaggccat ctgcttcttt ctaggggccc tgacctccat gccagctgtg aggacctttg | 2340 |

| | |
|--|------|
| ccttgacctc tggcttagca atcatctttg acttcctgct ccagatgaca gcctttgtgg | 2400 |
| ccctgctctc cctggatagc aagaggcagg aggcctctcg ccccgacgtc gtgtgctgct | 2460 |
| tttcaagccg aaatctgccc ccaccgaaac aaaaagaagg cctcttactt tgcttcttcc | 2520 |
| gcaagatata cactcccttc ctgctgcaca gattcatccg ccctgttgtg ctgctgctct | 2580 |
| ttctggctct gtttggagca aacctctact taatgtgcaa catcagcgtg gggctggacc | 2640 |
| aggatctggc tctgcccagg gattcctacc tgatagacta cttcctcttt ctgaaccggt | 2700 |
| acttggaagt ggggcctcca gtgtactttg acaccacctc aggctacaac ttttccaccg | 2760 |
| aggcaggcat gaacgccatt tgctctagtg caggctgtga gagcttctcc ctaaccaga | 2820 |
| aaatccagta tgccagtga ttccttaatc agtcttatgt ggctattgct gcctcctcct | 2880 |
| gggtagatga cttcatcgac tggctgaccc catcctcctc ctgctgccgc atttataccc | 2940 |
| gtggccccc a taaagatgag ttctgtccct caacggatac ttccttcaac tgtctcaaaa | 3000 |
| actgcatgaa ccgcactctg ggtcccgtga gaccacaaac agaacagttt cataagtacc | 3060 |
| tgccctgggt cctgaatgat acgcccaca tcagatgtct taaagggggc ctagcagcgt | 3120 |
| atagaacctc tgtgaatttg atctcagatg gccagattat agcctcccag ttcattggcct | 3180 |
| accacaagcc cttacggaac tcacaggact ttacagaagc tctccgggca tcccgggtgc | 3240 |
| tagcagccaa catcacagct gaactacgga aggtgcctgg gacagatccc aactttgagg | 3300 |
| tcttccctta cacgatctcc aatgtgttct accagcaata cctgacgggt ctccctgagg | 3360 |
| gaatcttcac tcttgctctc tgcttcgtgc ccacctttgt ggtctgctac ctctactgg | 3420 |
| gcctggacat acgctcaggc atcctcaacc tgctctccat cattatgatc ctctgggaca | 3480 |
| ccatcggcct catggctgtg tggggatatca gctacaatgc tgtgtccctc atcaacctg | 3540 |
| tcacggcagt gggcatgtct gtggagtctg tgtcccacat taccgggtcc tttgctgtaa | 3600 |
| gcaccaagcc taccggctg gagagagcca aagatgctac tatcttcatg ggcagtgcgg | 3660 |
| tgtttgctgg agtggccatg accaacttcc cgggcacct catcctgggc tttgctcagg | 3720 |
| cccagcttat ccagattttc ttcttccgcc tcaacctcct gatcacctg ctgggtctgc | 3780 |
| tacacggcct ggtcttcctg cccgttgctc tcagctatct ggggccagat gttaaccaag | 3840 |
| ctctgggtact ggaggagaaa ctagccactg aggcagccat ggtctcagag ccttcttgcc | 3900 |
| cacagtaccc ctccccggct gatgcaaaca ccagtgcct atgttaacta aggctttaat | 3960 |
| ccagaattta tccctgaaat taatgctgct agcagctctc tgcccaaaag tgaccaaaag | 4020 |
| ttctaattga gtaggagctt gtccaggctc catgggtctt gctgataagg ggccacgagg | 4080 |
| gtcttccctc tggttgtttc caaggcctgg ggaaagtgt tccagaaaaa aattgctggc | 4140 |

attcttgtcc tgaggcagcc agcactggcc actttgttgt cataggtccc cgaggccatg 4200
atcagattac ctccctctgta aagagaatat cttgagtatt gtatgggatg tatcacatgt 4260
caattaataaa ggccatggcc tatggcttag gcaggaaata ggggtgtggaa catccaggag 4320
aagaaaggat tctgggataa aggacacttg ggaacgtgtg gcagtgggtac ctgagcacag 4380
gtaattagcc atgtggcgaa atgtagatta atataaatgc atatctaagt tatgattcta 4440
gtctagctat atggccaagg tatttataaa t 4471

<210> 46

<211> 25

<212> DNA

<213> Artificial sequence

<220>

<223> primer

<400> 46

atgttaggtg agtctgaacc taccc

25

<210> 47

<211> 25

<212> DNA

<213> Artificial sequence

<220>

<223> primer

<400> 47

ggattgcatt tccttcaaga aagcc

25

<210> 48

<211> 25

<212> DNA

<213> Artificial sequence

<220>

<223> primer

<400> 48
tatggctctg ccctctgcaa tgctc

25

<210> 49

<211> 28

<212> DNA

<213> Artificial sequence

<220>

<223> primer

<400> 49
tcagcagcct ctgttccaca tacacttc

28

<210> 50

<211> 25

<212> DNA

<213> Artificial sequence

<220>

<223> primer

<400> 50
gttccacagg gtctgtggtg agttc

25